

Please Read Carefully.

TERMS.

F. O. B. Boston, invariably. { Care is taken in packing, and receipts are obtained for goods in "good condition." Our responsibility ceases here, and *we will not hold ourselves liable for breakage or loss in transit.*

All Claims on account of **Shortage** must be made within **ten days** after receipt of goods, or they will not be allowed.

Goods returned for credit without our consent will be held subject to the shippers' orders, but will not be credited under any circumstances.

Boxing in all cases is charged at cost.

In ordering, give Catalogue Numbers, and state whether goods are to be shipped freight or express, and by what line.

Accounts not otherwise agreed upon are payable thirty days from date of invoice.

If above rule is not observed, the account will be subject to sight draft without notice.

Prices subject to change without notice.

To protect ourselves and to avoid delay, **cash or satisfactory references** should accompany order.

Where goods are to be sent **C. O. D.**, a remittance of an amount sufficient to pay transportation charges both ways should accompany order.

THE HOLTZER-CABOT ELECTRIC CO.

Boston, Mass.





ANNOUNCEMENT.



THE Apparatus and Supplies, herein illustrated and described, have become Standards of excellence in their respective classes by the general approval of the Electrical Trades.

We invite Electricians and Supply Houses who desire to handle goods which are strictly first-class in construction and finish, to inspect our various Specialties.

Practical experience for a score of years in manufacturing apparatus and machinery of this description is an abundant guarantee of our ability to satisfy any reasonable demands which may be made on our skill.

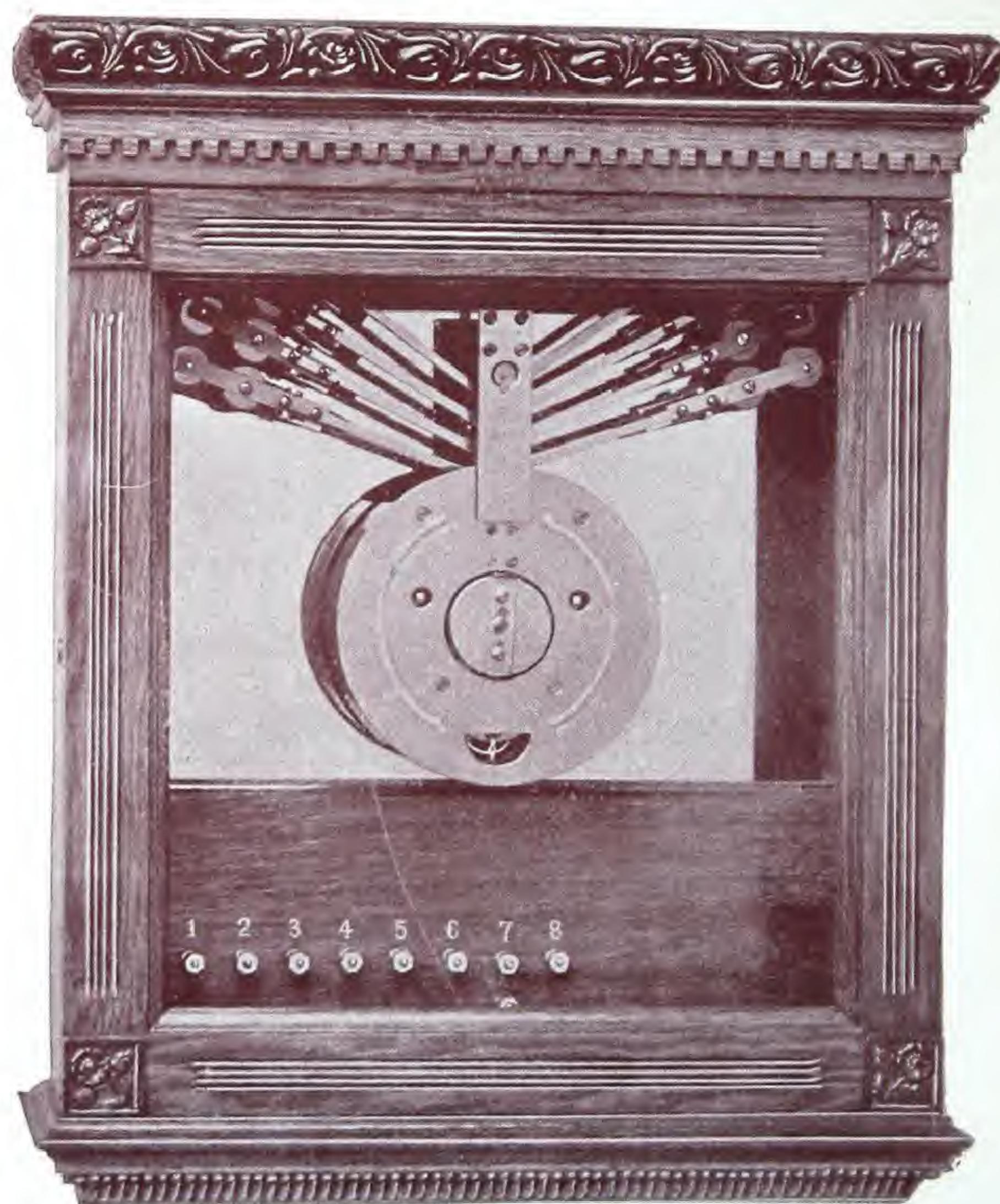
THE HOLTZER-CABOT ELECTRIC CO.
BOSTON, MASS.



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CCA



Mechanism of Time Detectors.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Watchmen's Time Detectors.

OPERATED BY

BATTERIES OR MAGNETO GENERATORS.

THESE Registers are extremely simple, and their few working parts are constructed with great thoroughness. Time Detectors are worthless if not always in order, and with this important fact in view we employ only the best of materials in their construction.

POINTS OF MERIT.

1st.—The **clock movements** employed in revolving the Dials are **thoroughly reliable time-pieces**.

2nd.—Our Detectors may be operated either by Magneto Stations or by Batteries. **Please state which is desired.**

The cut on opposite page shows the construction of our Registers. A separate electro-magnet is used for each station, and the lever striking the punch point is accurately balanced. Special attention is called to this Steel Punch, as by means of a spring contained inside the brass tube the point is kept from the paper dial, except when thrown forward for a puncture. All working parts are mounted on a heavy brass plate, thus securing solidity.

Add \$5.00 for each station in reckoning odd numbers or clocks above 25 stations.

From long experience it has been found disadvantageous to operate more than 25 stations upon one clock movement. In practice, it has been found impossible for a watchman to cover more than from twenty to twenty-five stations, hence we have made our limit at 25 stations for each dial.

See full page illustration of 40 station clock between pages 8 and 9, designed for 4 watchmen.

THE HOLTZER-CABOT ELECTRIC COMPANY. . . .

Boston, Mass.

Time Detectors.

(CONTINUED.)

Style D. Cat. No. (25).

CLOCK WITH REGISTER DIAL MOVEMENT ONLY.

Cases furnished in Oak, Ash, Walnut or Cherry Woods.

NOTE.—Only 25 stations can be applied to one movement. Clocks having more than this number are arranged as illustrated on page between 8 and 9.

THESE REGISTERS MAY BE

OPERATED BY EITHER MAGNETO OR BATTERY CURRENT.

This clock has Register Dial only, and where a separate time-piece is not desired, will meet the wants of Factories, etc., for a plain Time Detector.

SEE PAGE 4 FOR DESCRIPTION.

PRICE LIST.

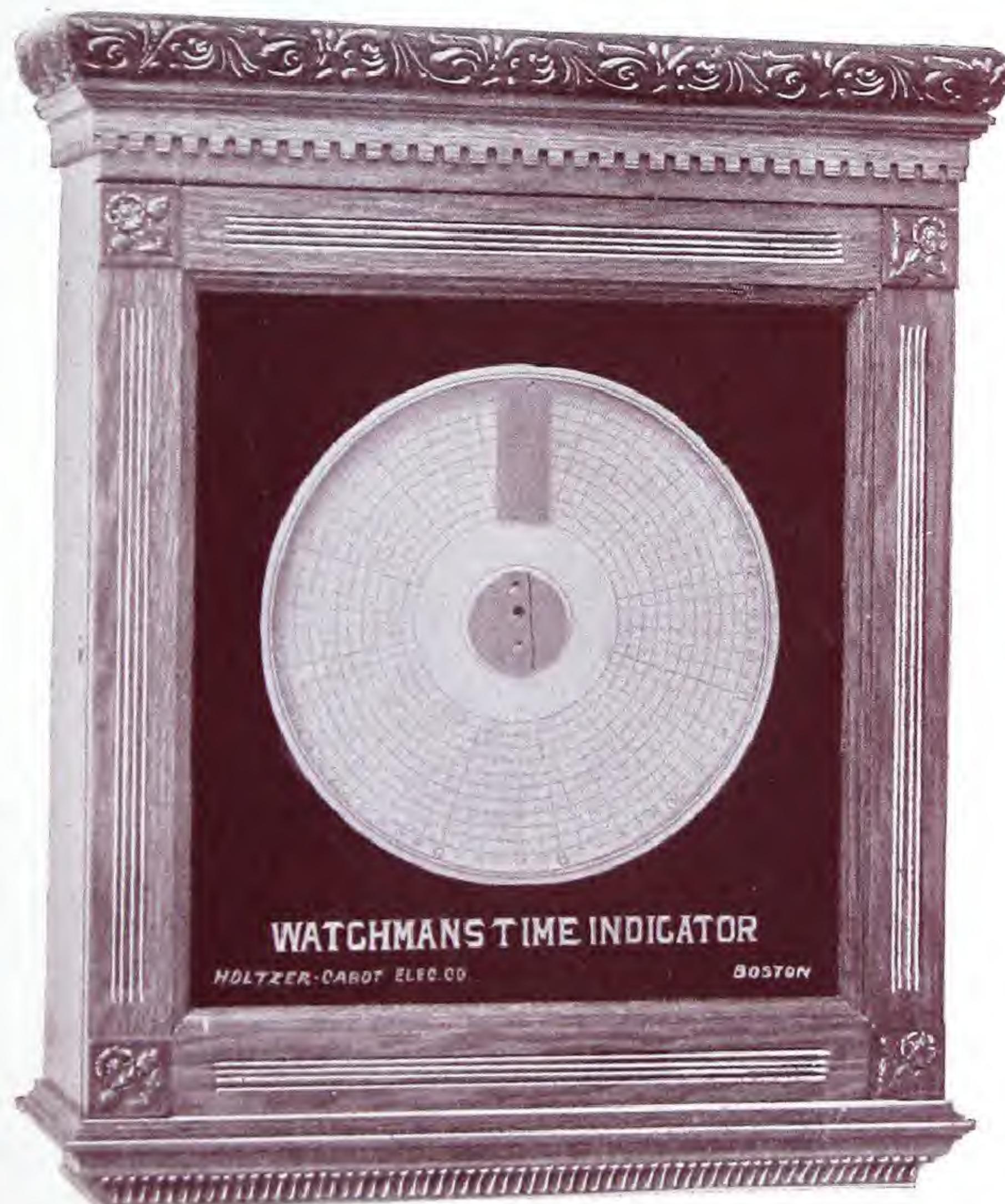
4	Station Register	\$60.00
6	"	70.00
8	"	80.00
10	"	90.00
15	"	115.00
20	"	140.00
25	"	165.00

Add \$5.00 for each extra Station in varying from above list.

A year's supply of Dials included with each clock.

MENTION CATALOGUE NUMBERS IN ORDERING

Style D, Register Clock.



Cat. No. 1251.

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CCA

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Time Detectors.

(CONTINUED.)

Style C. Cat. No. 1250.

MAY BE OPERATED BY EITHER MAGNETO OR BATTERY-CURRENT.



THIS Time Detector has an **Eight Day Office Clock** in addition to the Dial Movement. We guarantee it to be a reliable timepiece. The case is elegantly finished.

PRICE LIST.

4 Stations with Time Clock	.	.	.	.	.	.	.	.	\$75.00
6 "	"	"	"	"	.	.	.	.	85.00
8 "	"	"	"	"	.	.	.	.	95.00
10 "	"	"	"	"	.	.	.	.	105.00
15 "	"	"	"	"	.	.	.	.	130.00
20 "	"	"	"	"	.	.	.	.	155.00
25 "	"	"	"	"	.	.	.	.	180.00

Add \$5.00 for each additional Station above 25.

A year's supply of Dials is furnished with each clock.

IN ORDERING, MENTION CATALOGUE NUMBERS.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Time Detectors.

(CONTINUED.)

Style B. Cat. No. 1255.

Operated either
by
Magneto or
Battery Current.

Fully
Warranted
in
Every Detail.



Pendulum Movement Time Detector.

The above Register is specially adapted to Counting Rooms, Offices, etc., or wherever a Regulator Time-piece is desired.

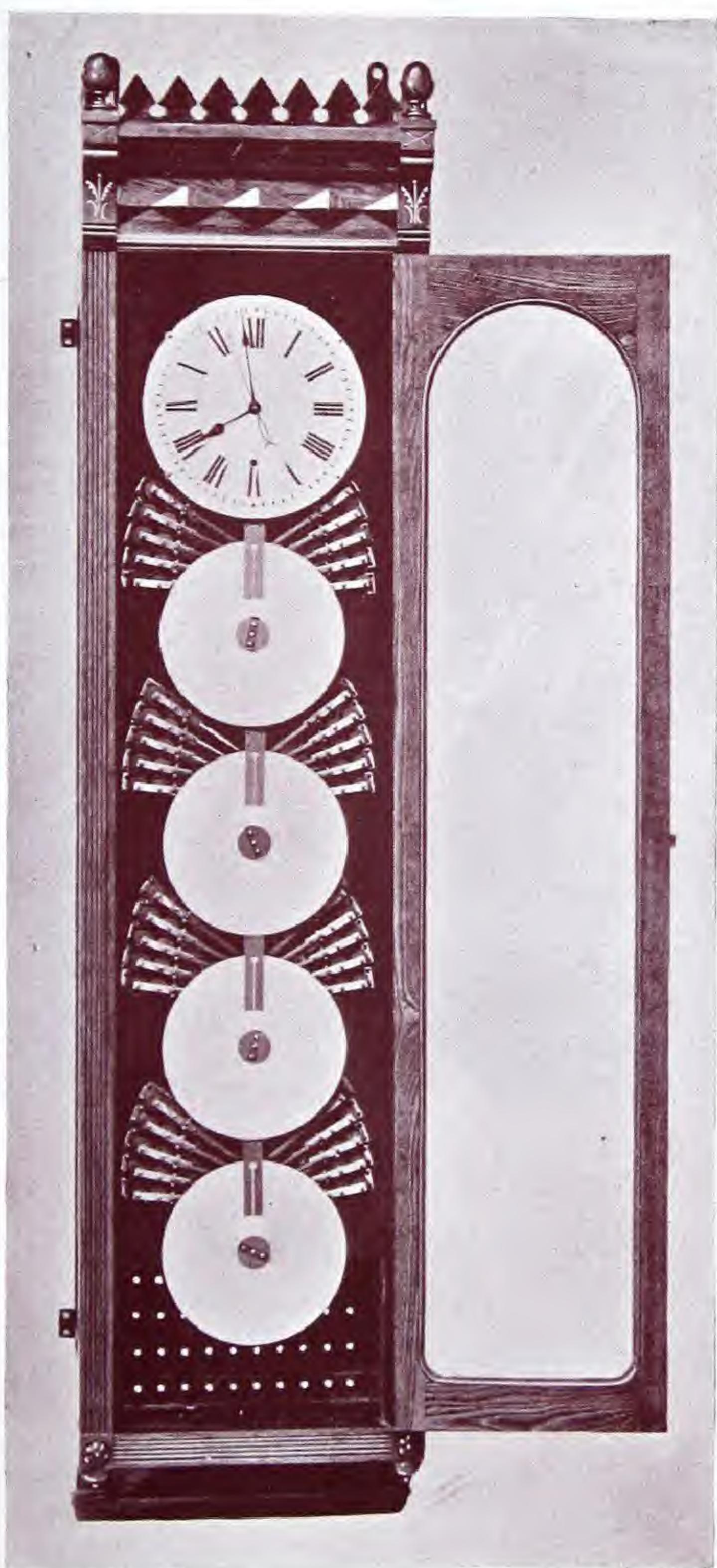
PRICE LIST.

Pattern B. Cat. No. 1255.

4 Stations	\$120.00
6 "	130.00
8 "	140.00
10 "	150.00
15 "	175.00
20 "	200.00
25 "	225.00

Add \$5.00 for each Station in varying from list prices.

MENTION CATALOGUE NUMBERS IN ORDERING.



Arrangement of Dials on a 40 Station Time Detector.

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CCA

...THE HOLTZER-CABOT ELECTRIC COMPANY...

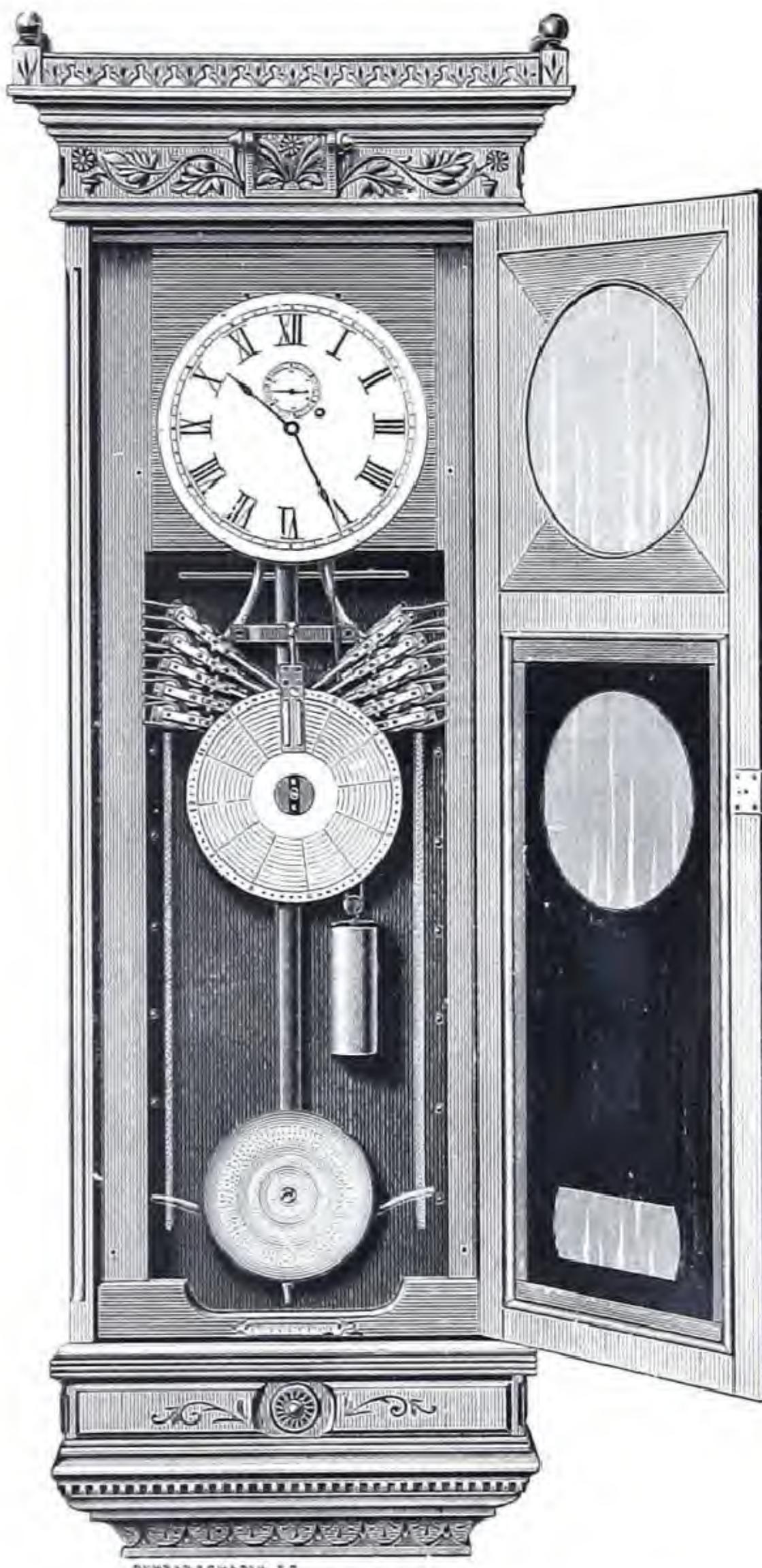
Boston, Mass.

Time Detectors.

(CONTINUED.)



Style A
With Pendulum Movement.
Cat. No. 1252.



Style A
Showing Interior Arrangement.
Cat. No. 1252.

Operated either by Magneto or Battery Current.

THIS is the most elegant Register we manufacture. It has a **Regulator** Time-piece of the highest grade, with 39-inch pendulum and 8-day movement. Its case is of elegant design, and is highly finished. For large corporations, etc., it is most appropriate in every way.

PRICE LIST.

4 Stations Complete	.	.	.	.	.	.	.	\$175.00
6 "	"	.	.	.	.	.	.	185.00
8 "	"	.	.	.	.	.	.	195.00
10 "	"	.	.	.	.	.	.	205.00
15 "	"	.	.	.	.	.	.	230.00
20 "	"	.	.	.	.	.	.	255.00
25 "	"	.	.	.	.	.	.	280.00

Extra Stations, \$5.00 each.

A year's supply of Dials with each clock.

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Magneto Stations.

CURRENT IS ALWAYS AVAILABLE.

HIIS generator gives a direct current equal to eight cells of our well known Cylinder Battery. The handle is removable and is carried by the watchman on his rounds. It is strongly made, and we recommend it where the care of batteries is an annoyance.

PRICE.

Cat. No. 1254	\$5.00
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Cat. No. 1254.



Cat. No. 1253.



Cat. No. 1253. Each

Special Key Station.

NEW DESIGN.

HIIS Station is made of metal, and is neatly japanned. Its Contact Springs are of Phosphor Bronze, and are very durable

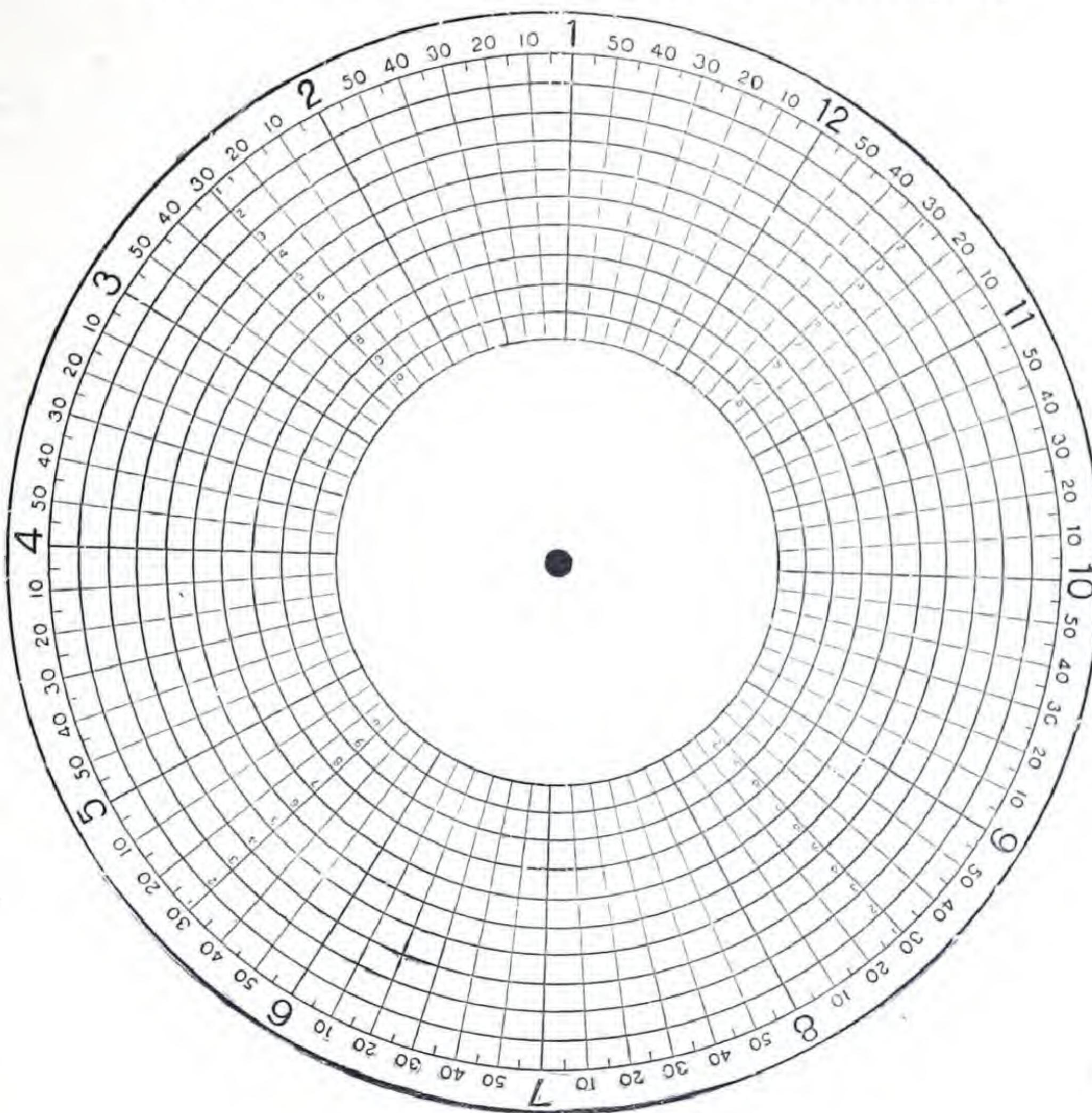
PRICE.

Cat. No. 1253. Each	\$1.00
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....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Dial Sheets for Time Detectors.



DESCRIPTION.

OUR Dial is divided into twelve parts, each division being subdivided into six sections. As it is attached to the front of the register clock movement, it revolves with it, the section over the punch point corresponding with the time of day.

DIRECTIONS.

To insert sheet in clock, remove clamp from face of clock barrel, and place sheet on pivot. Turn the dial sheet until the hour and minute, at time of insertion, are exactly behind the long slot through which the needles pass. Replace the clamp, and the dial will revolve in unison with the clock.

PRICE OF DIAL SHEETS.

Actual Size, 9 3-4 inches for 10-Station Sheet.

CAT. No.		PRICE.
1280	Sheets for 10 Station Register per 100	\$1.00
1281	" " 15 " " 100	1.25
1282	" " 20 " " 100	1.50
1283	" " 25 " " 100	2.00

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electro-Mechanical Gongs

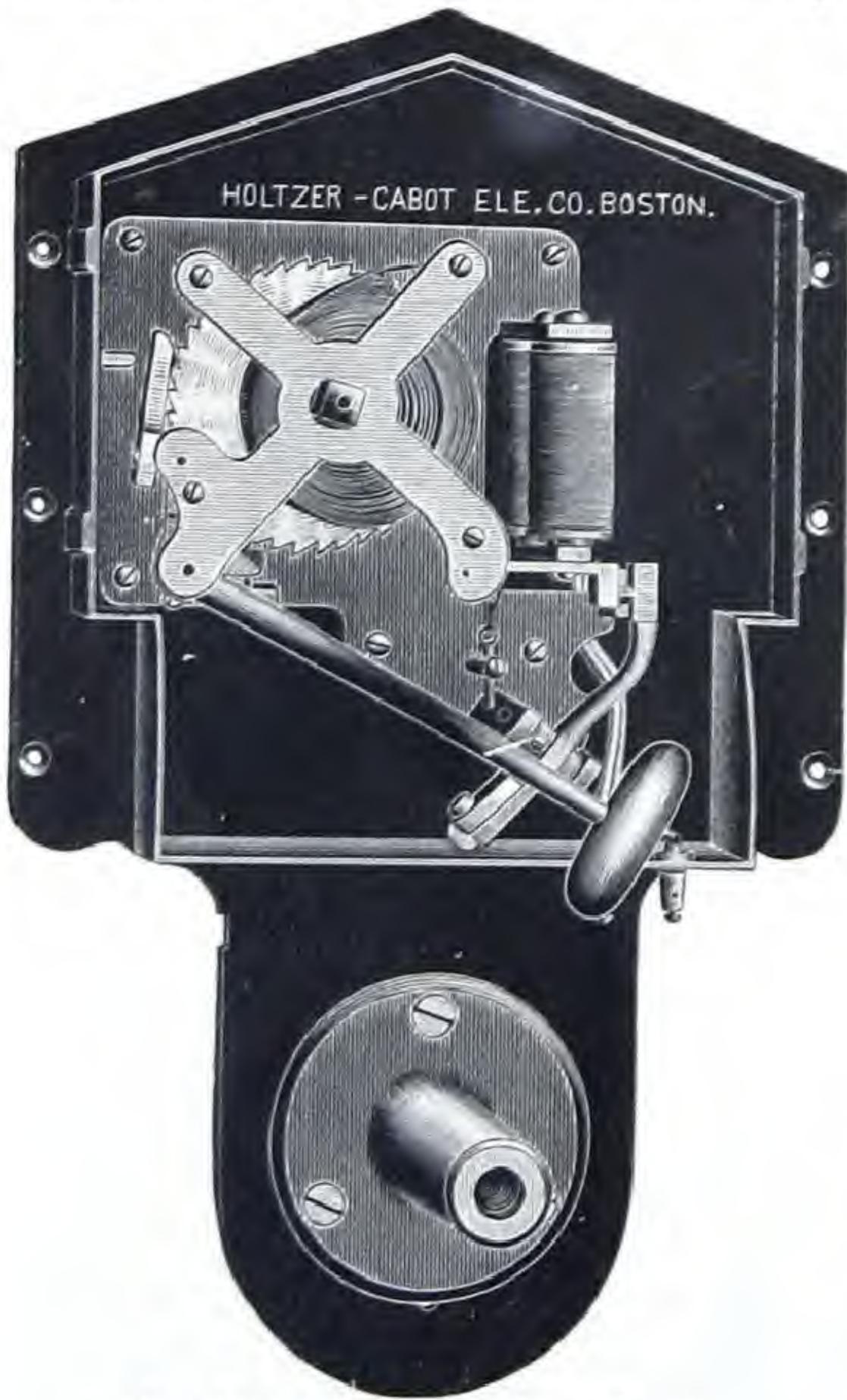
FOR

HOTELS, MINES, SCHOOLS, FACTORIES, AND FIRE ALARM
SYSTEMS.

Single Stroke or Continuous Ringing.

IN all places where a **LOUD, SHARP** sound for signalling is required, these Gongs will be found invaluable. They give a **POWERFUL BLOW**, and but little battery power is **REQUIRED** for their operation. **Municipal Fire Departments** will find

them the equal in every respect of the higher-priced instruments on the market. We wind them to any desired resistance. They may also be fitted with Lightning Arrester, and the magnets may be made adjustable to Armature when intended for Fire Alarm Circuits.



Cut Illustrating Iron Case Gong,
Cover Removed.

READ CAREFULLY.

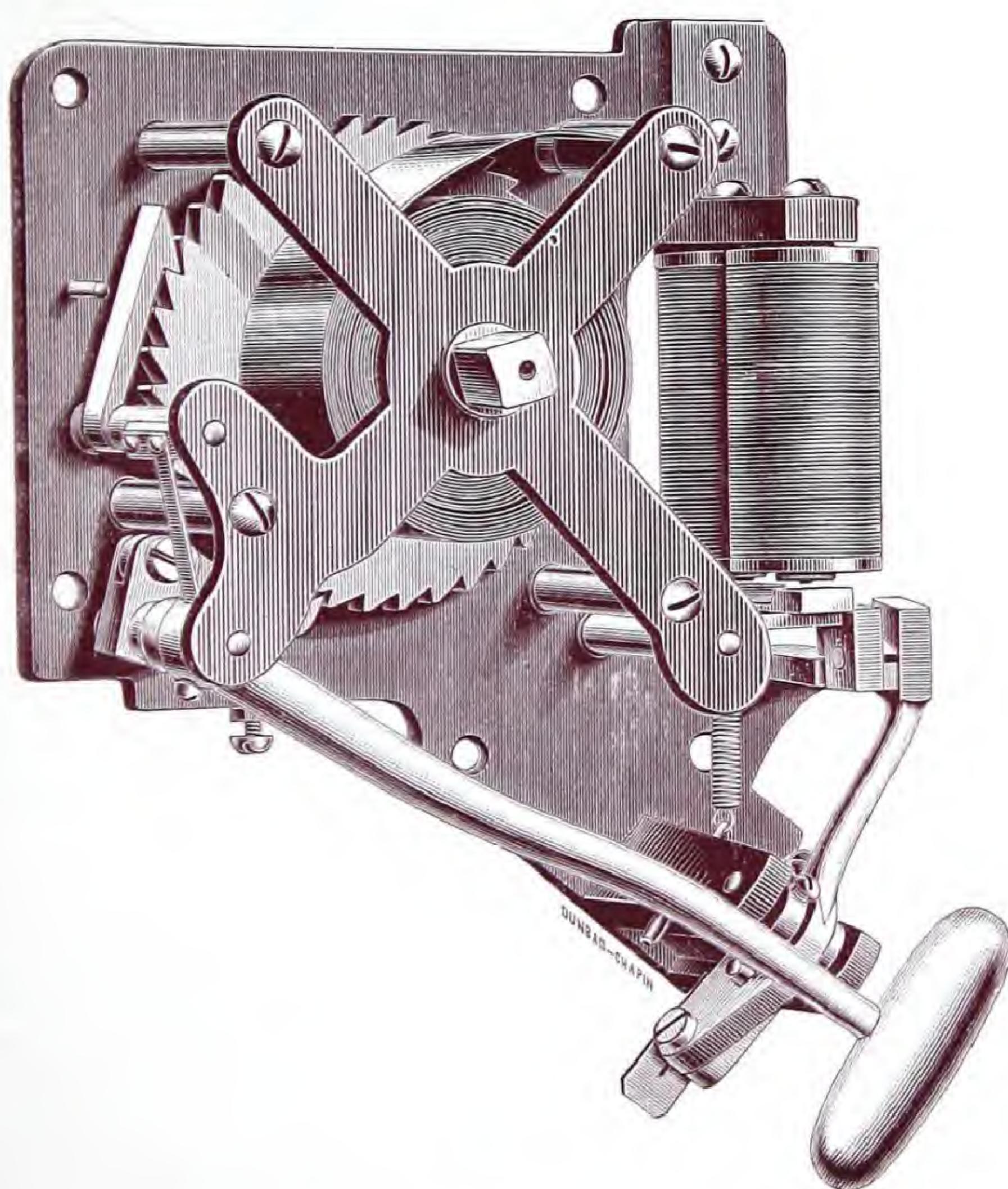
In ordering, specify whether Single Stroke or Continuous Ringing Gong is desired, and whether in Wood or Iron Case. If it is intended for closed circuits where other gongs are already in operation, state the *resistance* of the electro magnets on the line, *the system* in use, etc.

Will Strike from 300 to 400 Blows at One Winding.

THESE GONGS ARE EASILY CHANGED

From Single Stroke to Continuous Ringing by the removal of one Escapement Pin.

Movement of
Holtzer Electro-Mechanical



Swinging Hammer Gong.

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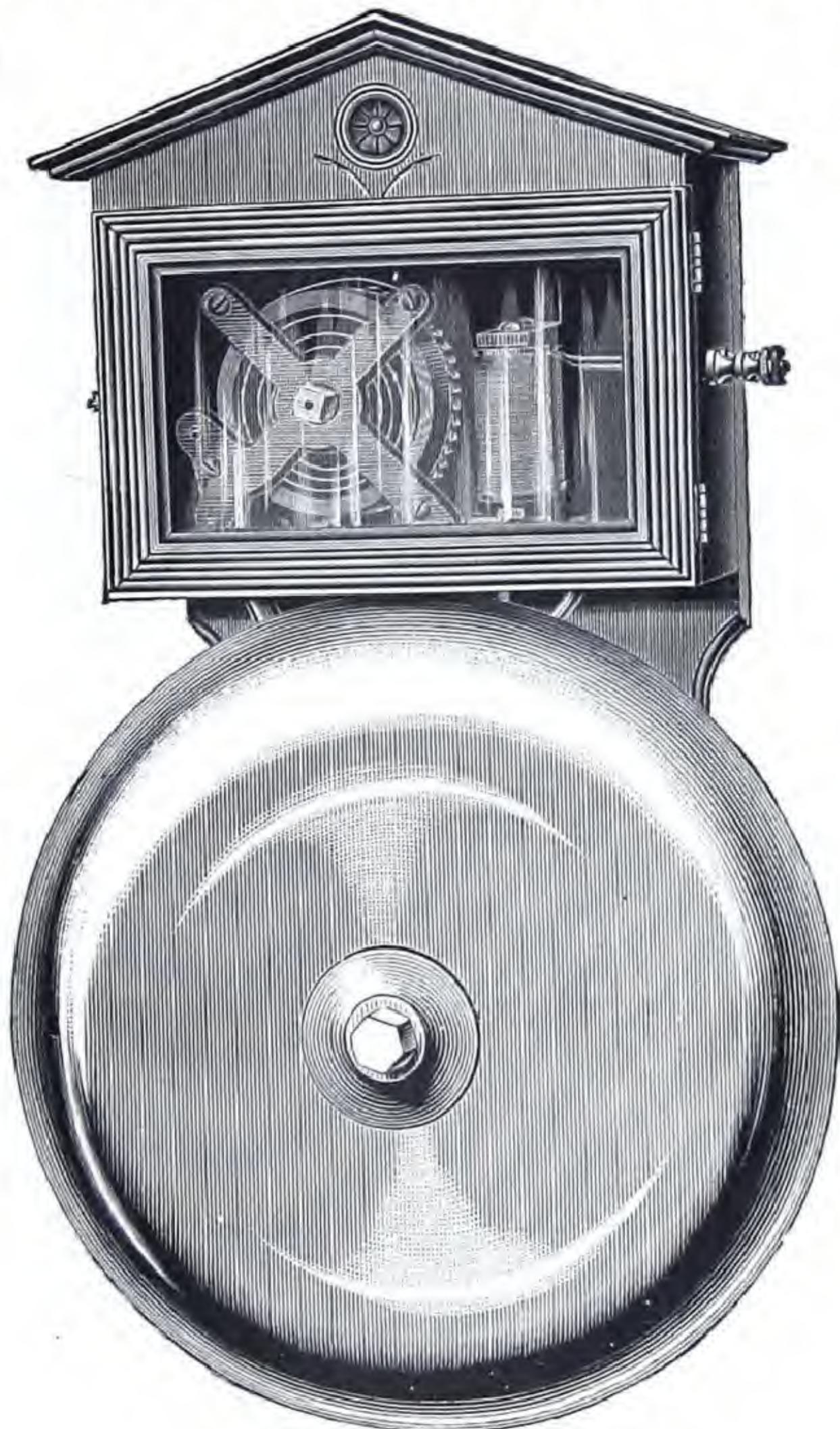


CCA

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electro-Mechanical Gongs.



Pattern N.

WOOD CASE.

WE keep cases in cherry and oak in stock. Ordinarily we wind the Electro-magnets of these Gongs to about 6 ohms resistance. If intended to work in the same circuit with other gongs, our remarks on page 12 with reference to resistance should be carefully noted and followed.

PRICE LIST.

CAT. NO.	DIAMETER OF GONG.	PRICE.			
		No. 1 Movement	...	...	...
435A	8 inches	“ 1	“	“	\$27.00
436A	10 “	“ 1	“	“	28.50
437A	12 “	“ 2	“	“	31.00
438A	14 “	“ 2	“	“	34.00
439A	15 “	“ 2	“	“	40.50
440A	16 “	“ 3	“	“	45.00
441A	18 “	“ 3	“	“	54.00
442A	20 “	“ 3	“	“	62.50

These Gongs can be fitted for Municipal Fire-Alarm Systems at a cost of \$10.00 each additional to list prices. This charge is for Lightning Arresters and Adjustable Magnets.

GIVE CATALOGUE NUMBERS IN ORDERING.

THE HOLTZER-CABOT ELECTRIC COMPANY.

Boston, Mass.

Electro-Mechanical Gongs.



Pattern M.

IRON CASE

THE above pattern is specially constructed for use in all places where the working parts will be exposed to the action of the atmosphere. Its case is neatly japanned and striped. Principal working parts are silvered to prevent corrosion.

PRICE LIST.

Cat. No.	Diameter of Gong.	No. 1 Movement	Price.
435	8 inches	1	\$27.00
436	10 "	1	28.50
437	12 "	1	31.00
438	14 "	1	34.00
439	15 "	1	40.50
440	16 "	1	45.00
441	18 "	1	54.00
442	20 "	1	62.50

State whether Single Stroke or Continuous Ringing Gong is desired.

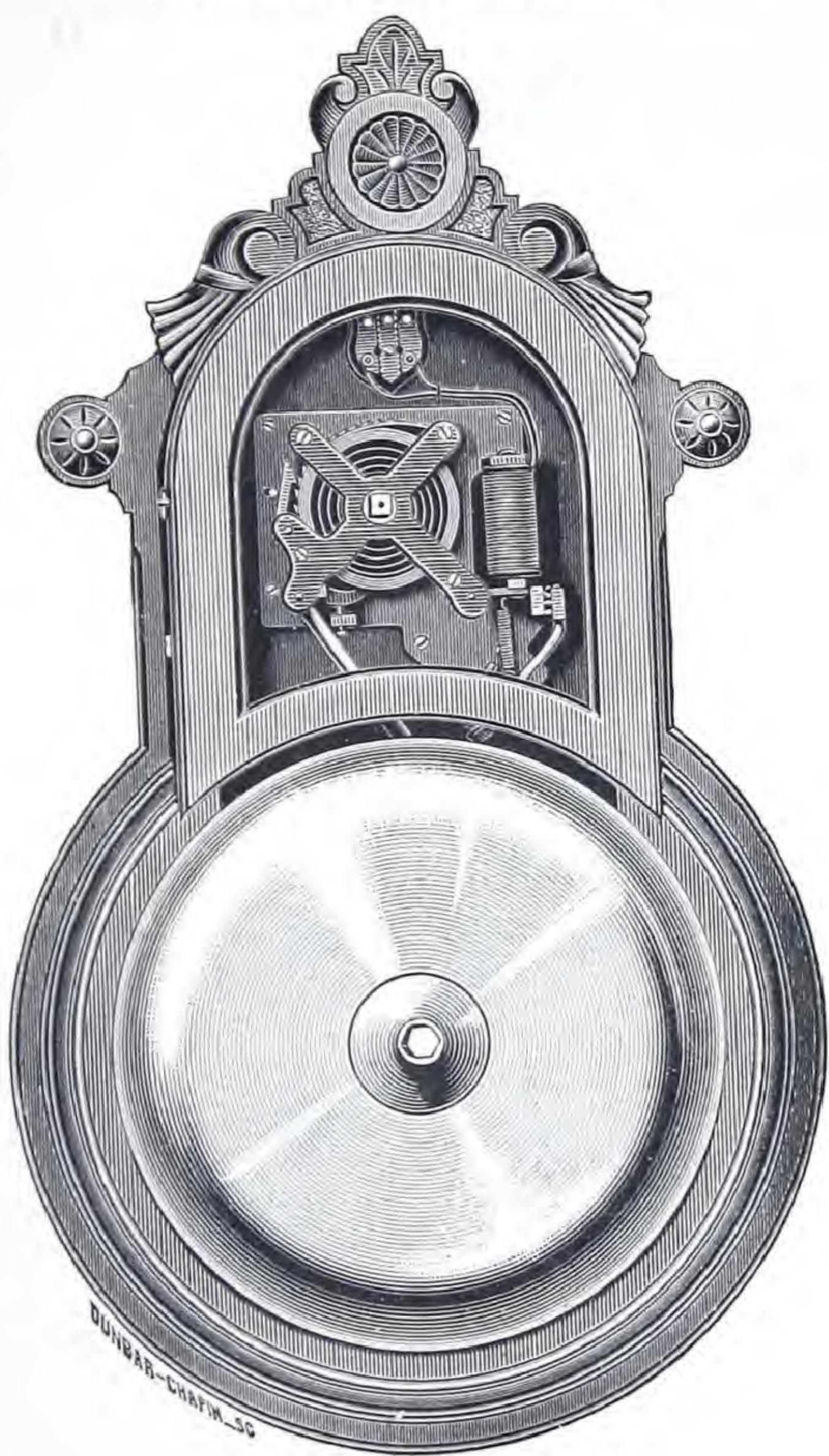
GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electro-Mechanical Gongs.

SPECIAL FIRE-ALARM PATTERN.



Pattern L.

ORNAMENTAL WOOD CASE, ELEGANTLY FINISHED.

ELECTRO-MAGNETS ADJUSTABLE TO ARMATURE.

FITTED WITH LIGHTNING ARRESTER, ETC.

PRICE LIST.

CAT. NO.	DIAMETER OF GONG.	PRICE.
460	14 inches	\$60.00
461	15 "	65.00
462	16 "	70.00
463	18 "	80.00
464	20 "	90.00

MENTION CATALOGUE NUMBERS IN ORDERING.

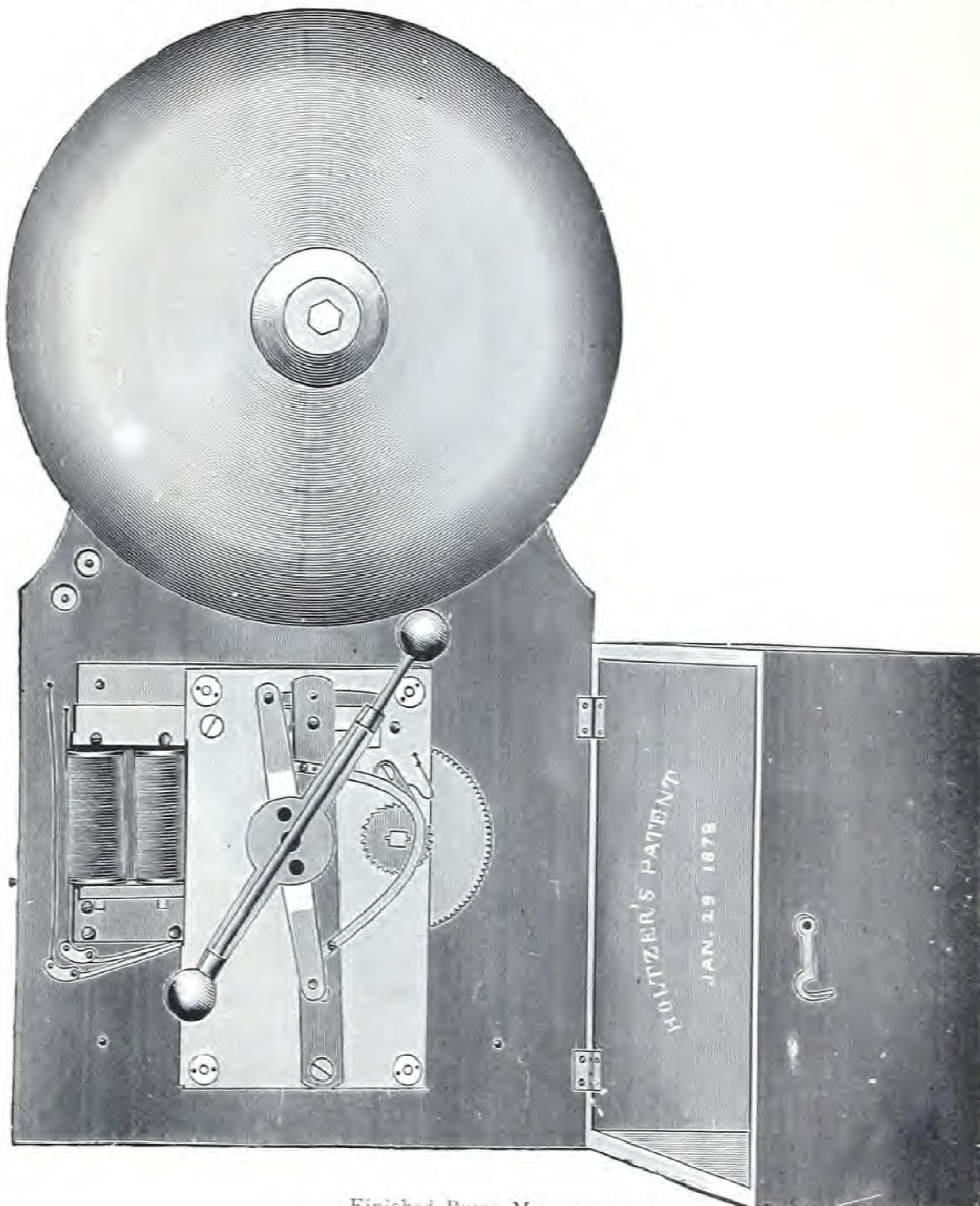
THE HOLTZER-CABOT ELECTRIC COMPANY.

Boston, Mass.

Electro-Mechanical Gongs.

Pattern O.

THE HOLTZER PATENT REVOLVING HAMMER GONG.



Finished Brass Movement.

HARDENED STEEL ESCAPEMENT.
GLASS FRONT.

PRICE LIST.

CAT. NO.	DIAMETER OF GONG.	PRICE.
452	8 inches	\$30.00
453	10 "	31.20
454	12 "	33.60

Made in wood cases only.

MENTION CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

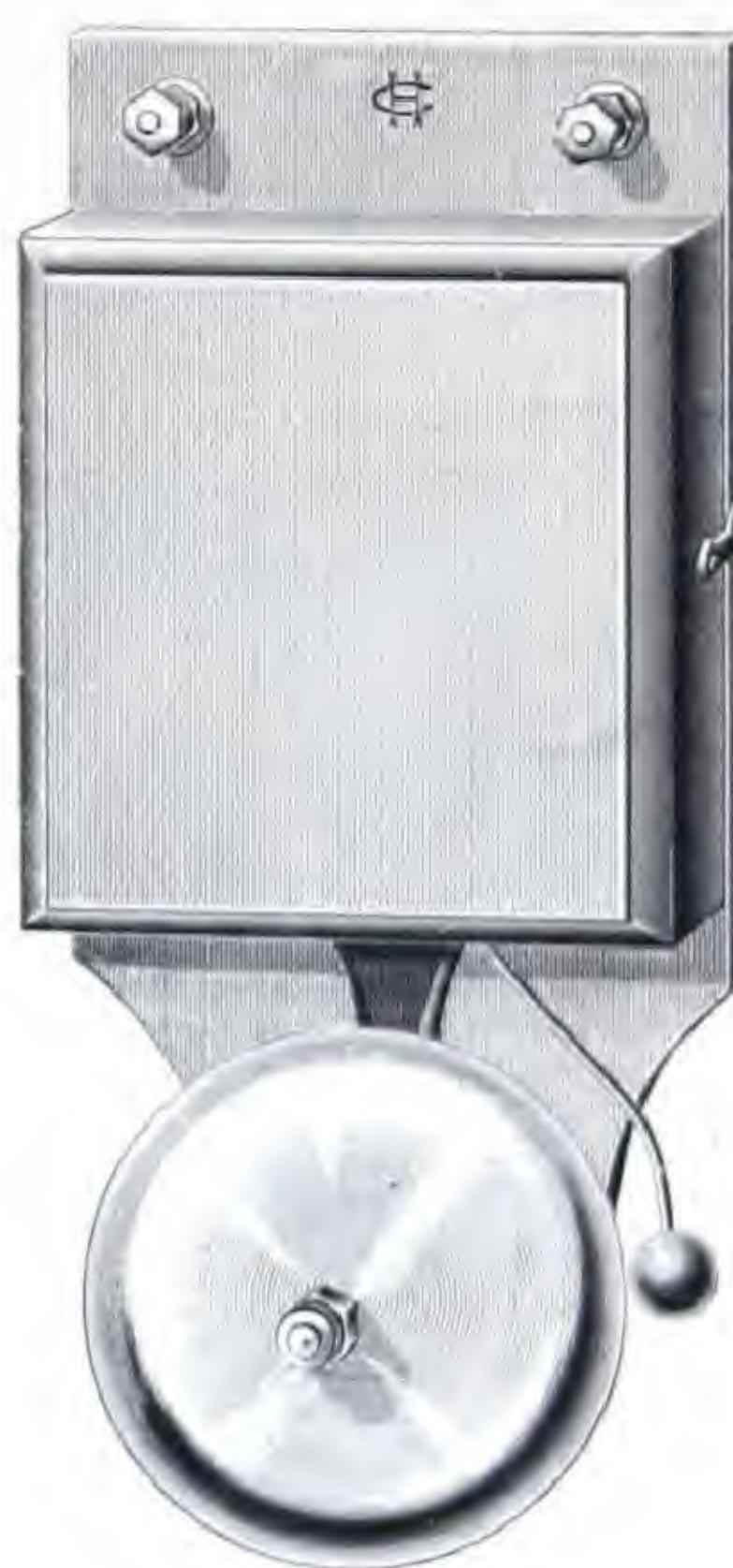
Boston, Mass.

The Holtzer Standard Wood Box Electric Bells.

THE box and base are finely finished and are made of thoroughly seasoned wood. The iron is well annealed and japanned. The magnets are covered with insulated wire of the best grade, and are wound to give the best results on circuits of moderate length.

All Bells have our regular double adjustment (see cut), thus making it possible to adapt them to battery currents of any strength.

SEE PAGES 18 AND 19 FOR GONGS OF DIFFERENT TONES.

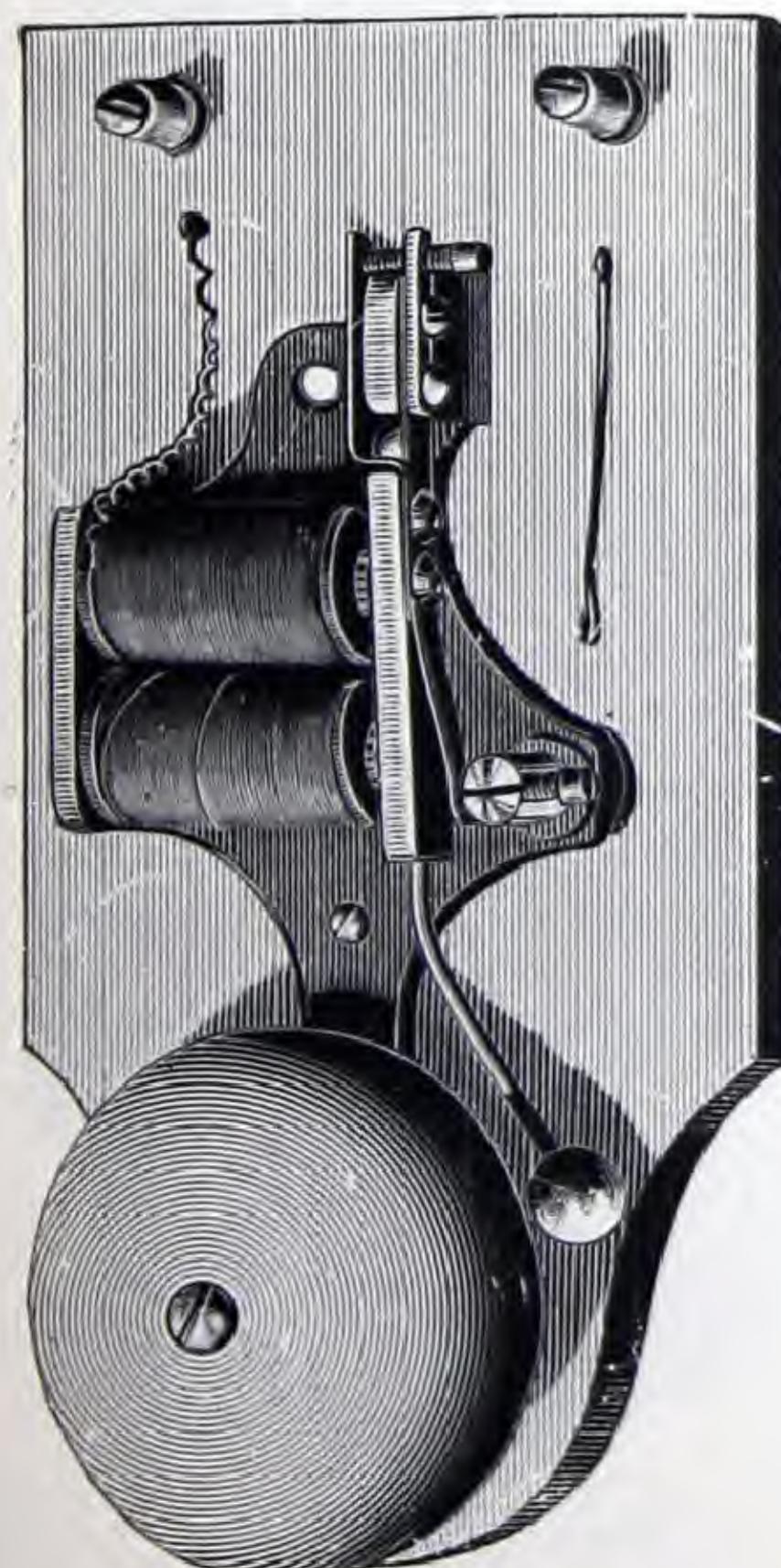


PRICES OF WOOD BOX GONGS.

CAT. NO.	PRICE.
370. No. 1. 2½ inch Gong (vibrating)	\$1.12
371. " 2. 3 " " "	1.25
372. " 3. 3½ " " "	1.50
373. " 4. 4 " " "	2.00
374. " 5. 5 " " "	2.75
375. " 6. 6 " " "	3.50
376. " 7. 7 " " "	4.50
377. " 8. 8 " " "	6.00
378. " 10. 10 " " "	7.50

ELECTRIC BELLS WITH WOOD GONGS.

We furnish Cat. No. 370 with a wood gong where a mild-toned bell is desired.



PRICE.

2½ inch Bell, with wood gong \$1.20

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

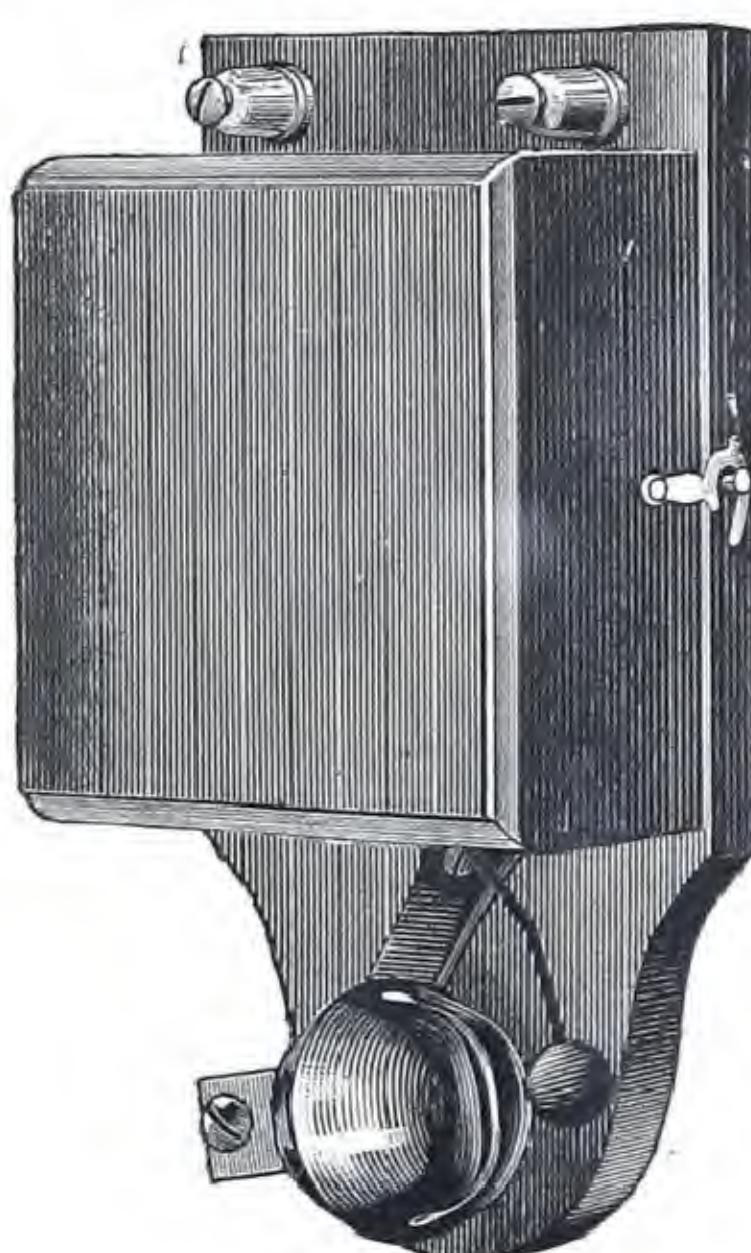
Boston, Mass.

Electric Bells with Distinctly Different Tones.

STANDARD PATTERN. WOODEN BOX BELLS.

A LARGE demand has been created for Electric Bells of widely different tones, for use where two or more bells are within the same hearing.

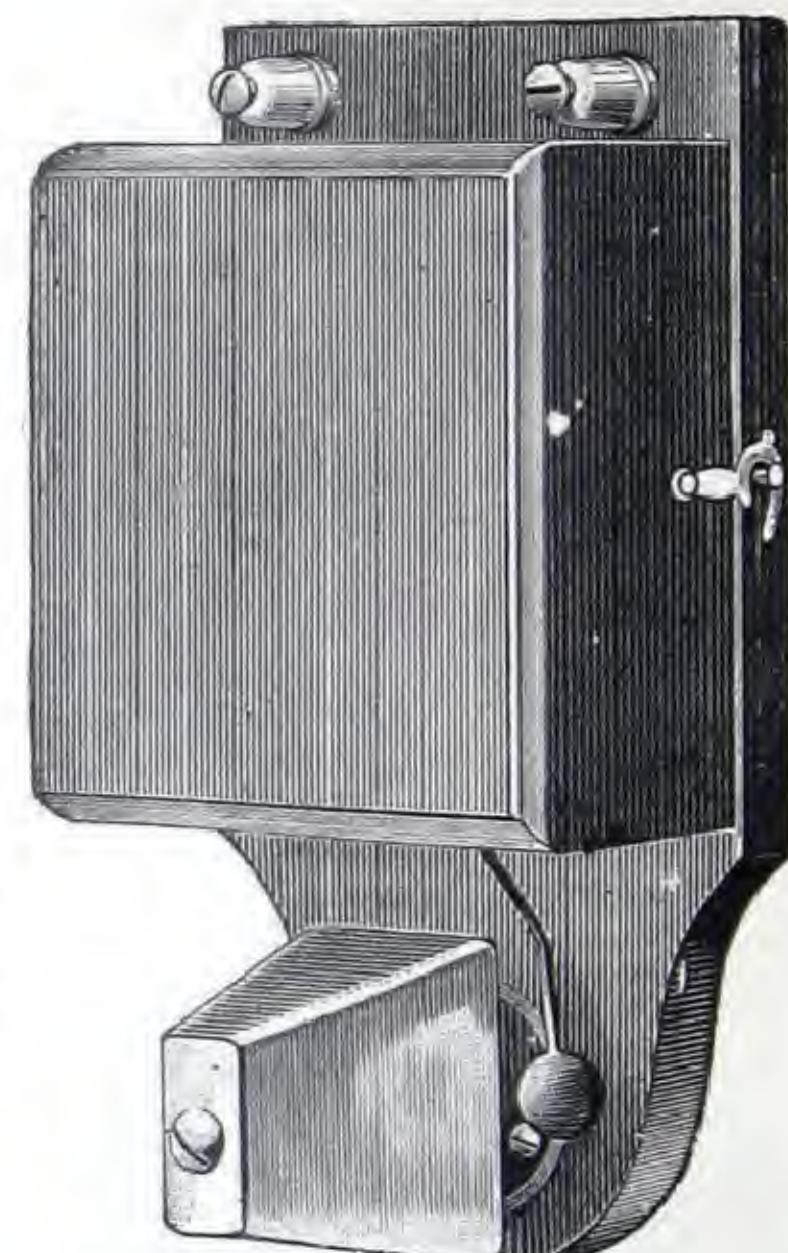
Please remember that *all* of these bells contain the many good qualities described on page 17.



Sleigh Gong

SLEIGH GONG.

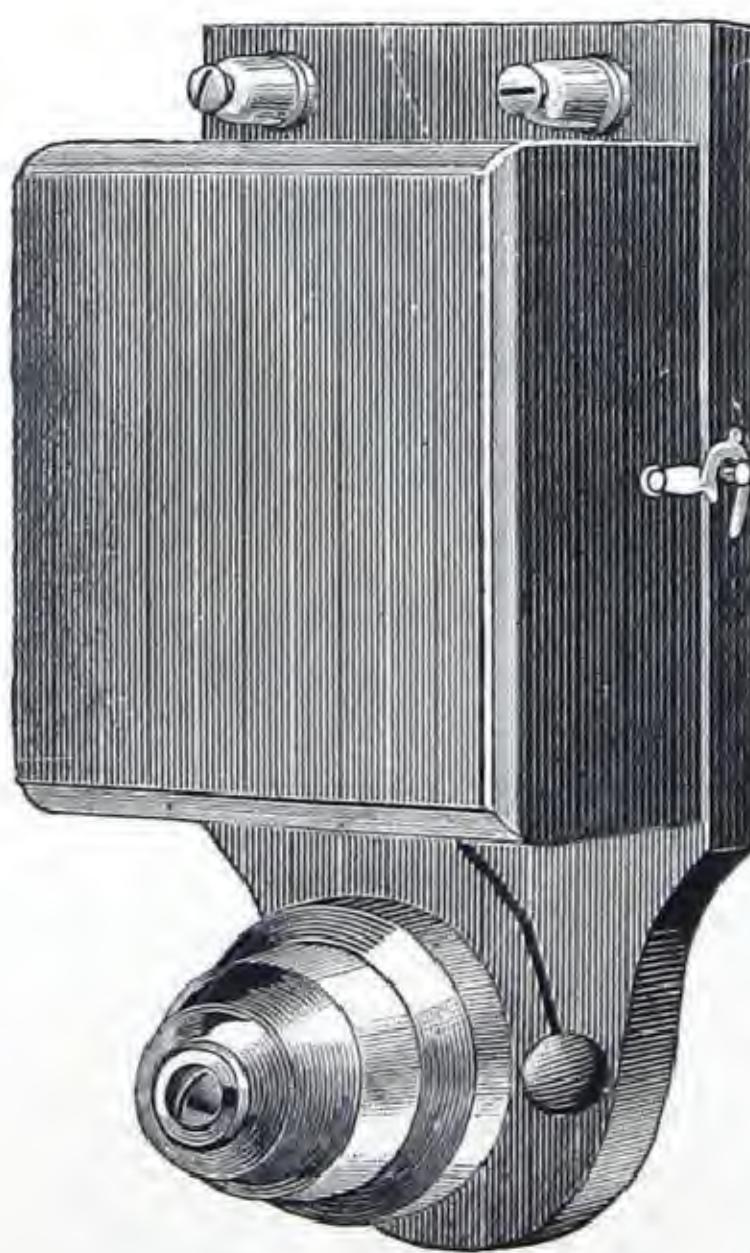
CAT. NO.	PRICE.
380. 1 $\frac{3}{8}$ inch Gong . . .	\$1.25
381. 1 $\frac{5}{8}$ " " . . .	1.50



Rectangular Gong.

RECTANGULAR GONG.

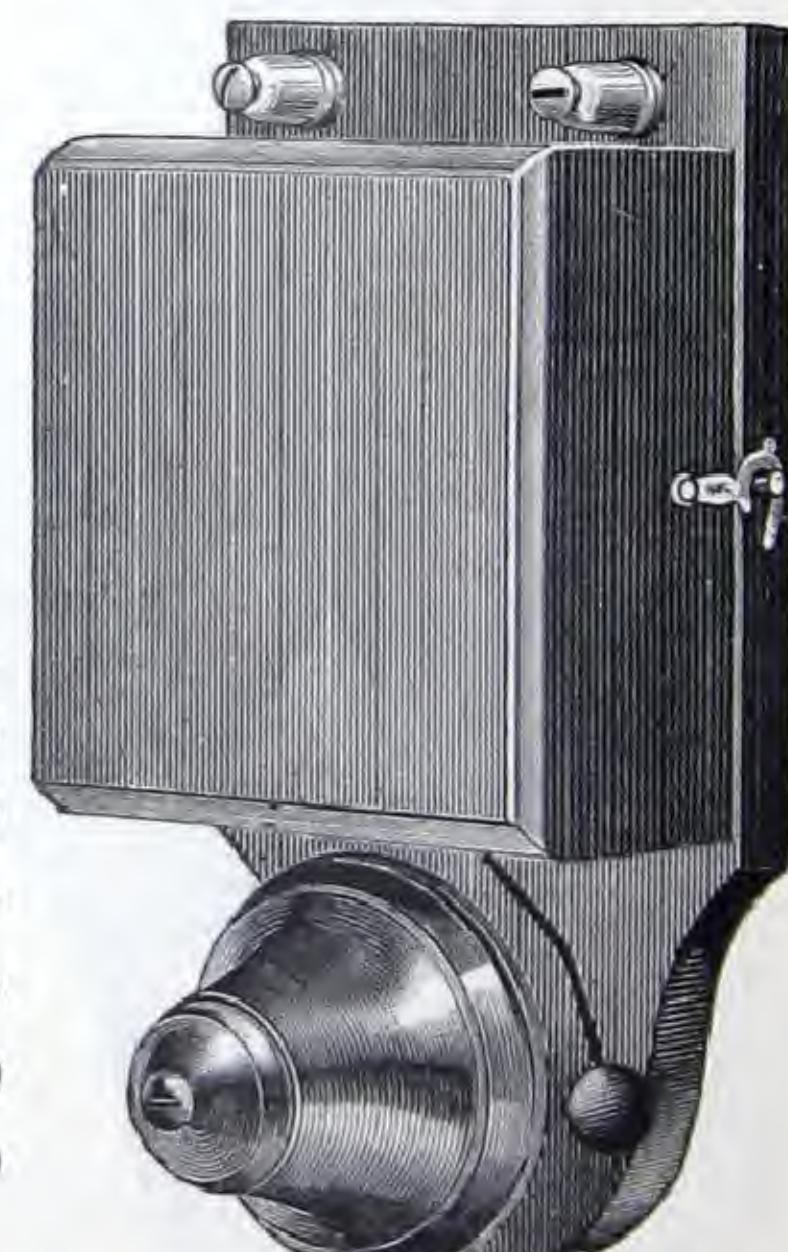
CAT. NO.	PRICE.
382. 1 $\frac{7}{8}$ inch Gong . . .	\$1.25
383. 2 " " . . .	1.50
384. 2 $\frac{1}{8}$ " " . . .	2.00



Garland Gong.

GARLAND GONG.

CAT. NO.	PRICE.
385. 1 $\frac{7}{8}$ inch Gong . . .	\$1.30



Open Gong.

OPEN GONG.

CAT. NO.	PRICE.
386. No. 1	\$1.25
387. " 2	1.50
388. " 3	2.00
389. " 4	3.00
389A. " 5	4.50
389B. " 6	6.00

GIVE CATALOGUE NUMBERS IN ORDERING.

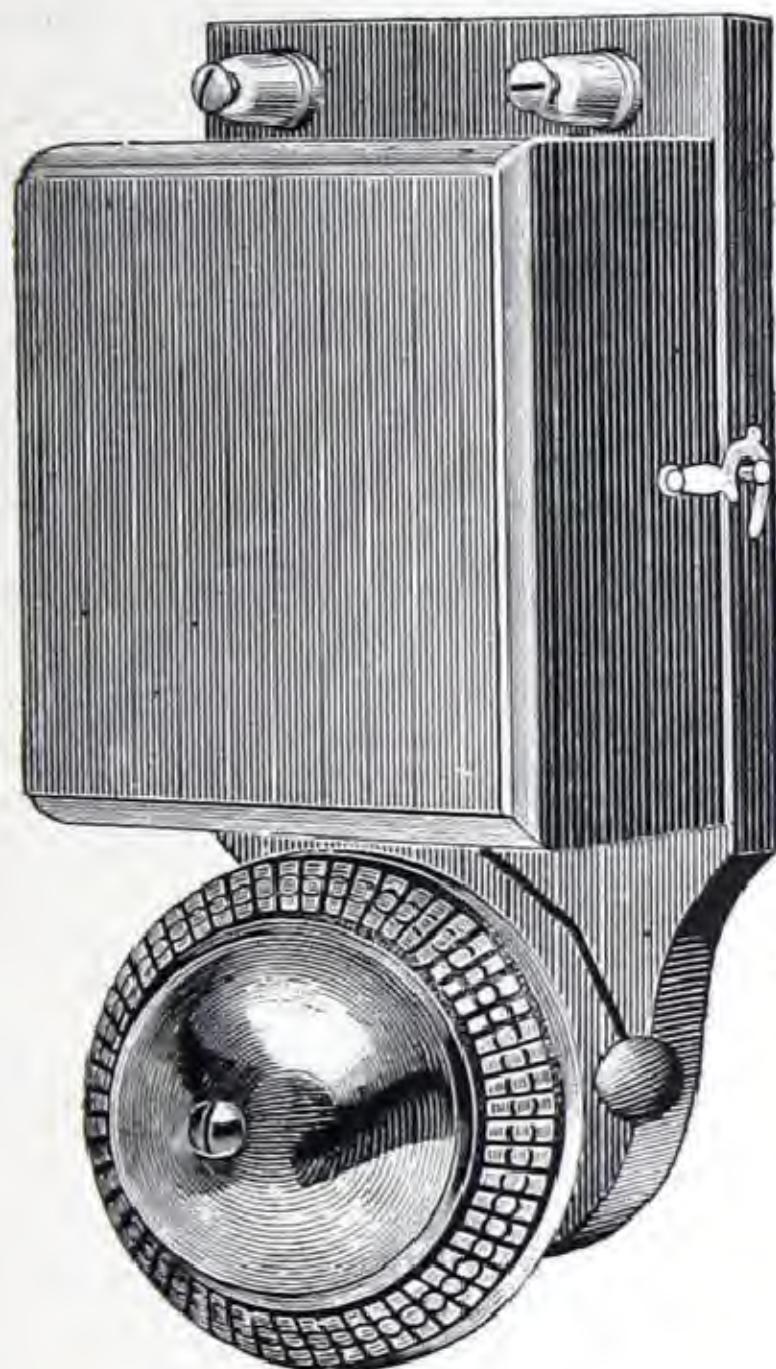
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electric Bells with Distinctly Different Tones.

STANDARD PATTERN. WOODEN BOX BELLS.

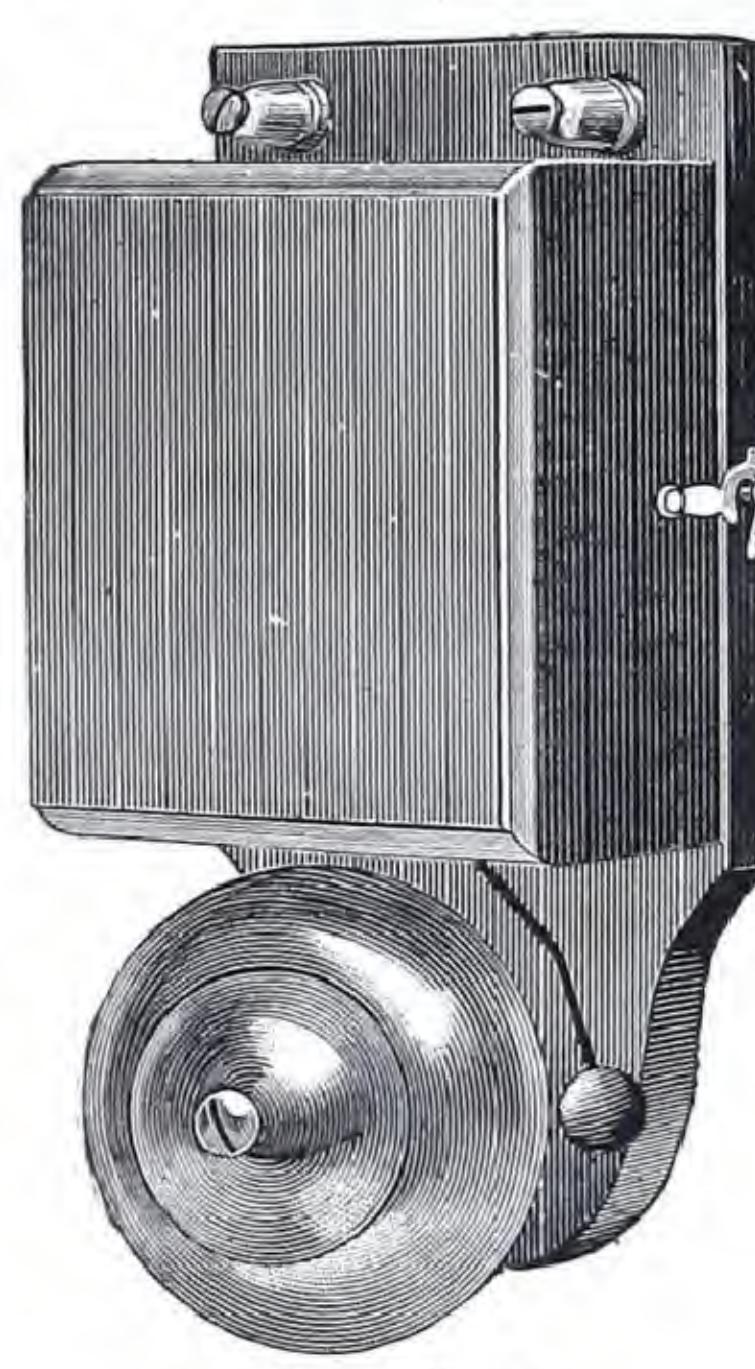
Different toned bells, for ordinary calls or for use where two or more bells are within the same hearing. (For description see page 17.)



Fancy Gong.

CAT. No.
390. 3 inch Gong

PRICE.
\$1.40



Dome Gong.

CAT. No.
391. 2½ inch Gong
392. 3 " " " " "

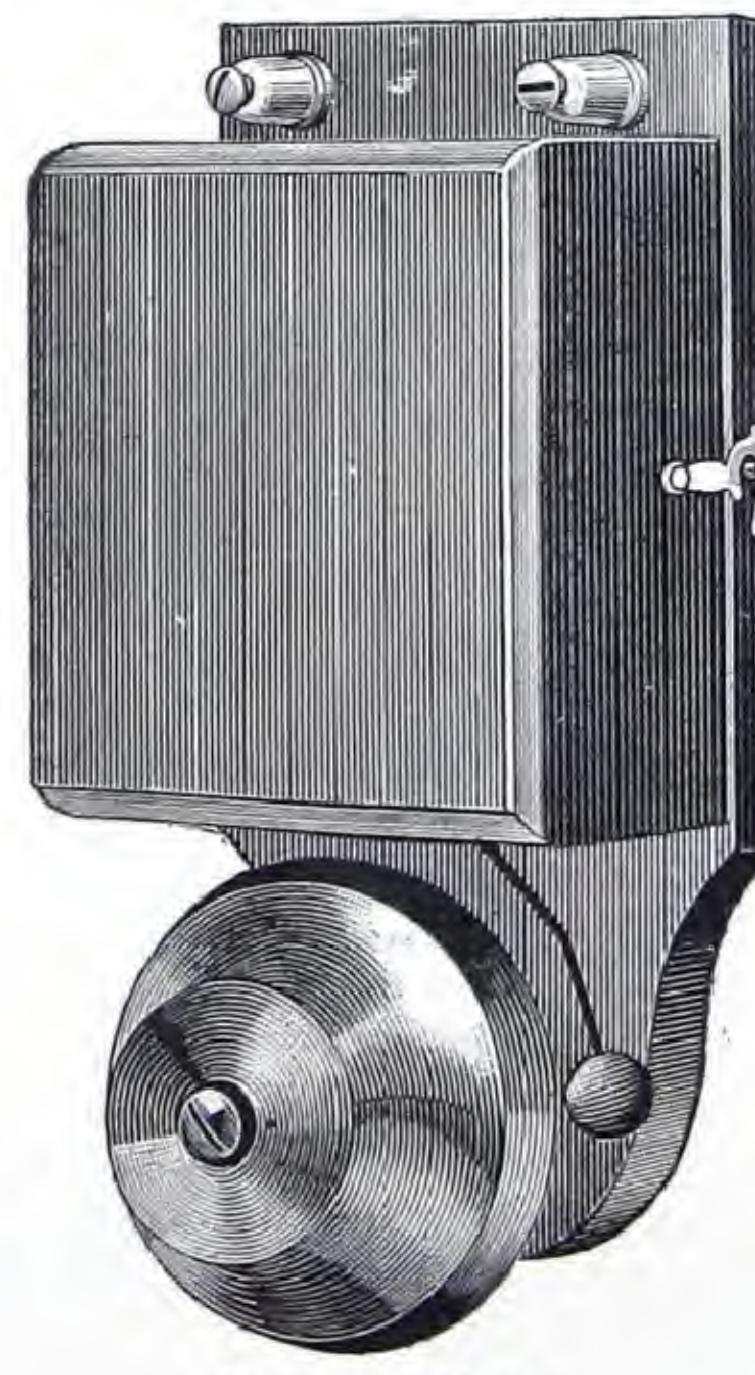
PRICE.
\$1.30
1.50



Swiss Gong.

CAT. No.
393. 2½ inch Gong

PRICE.
\$1.30



Concave Gong.

CAT. No.
394. 2½ inch Gong
395. 3 " " " " "

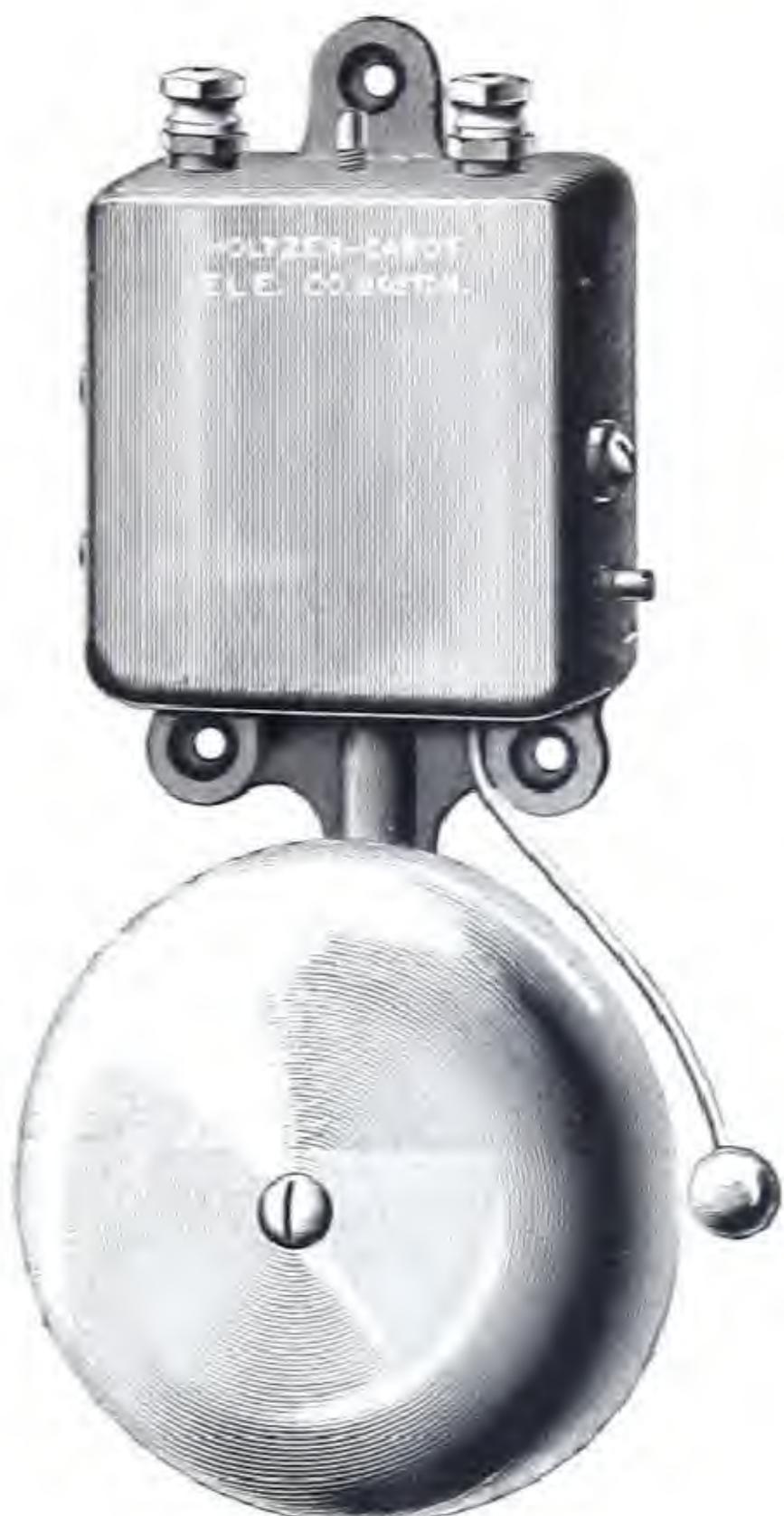
PRICE.
\$1.30
1.65

MENTION CATALOGUE NUMBERS IN ORDERING.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Holtzer Iron Box Bells.



ALL bells made by us have a Double Adjustment whether Wood or Iron Box or of the Skeleton pattern. The Iron Box Bell here illustrated may be specially wound to ring on one cell of the Sal-Ammoniac batteries in common use. It is neat in design, and is constructed of the very best materials. It has every good quality of our Standard Wood Box Bell. We solicit comparison with the cheap bells on the market at the present time.

CAT. No.	PRICE LIST.						PRICE
	396.	2 $\frac{1}{2}$ inch Gong	.	.	.	.
397.	3	"	"	"	"	"	1.10
398.	3 $\frac{1}{2}$	"	"	"	"	"	1.25
399.	4	"	"	"	"	"	1.50

Special Prices to the Trade.

The Acme Skeleton Bell.

DOUBLE ADJUSTMENT.

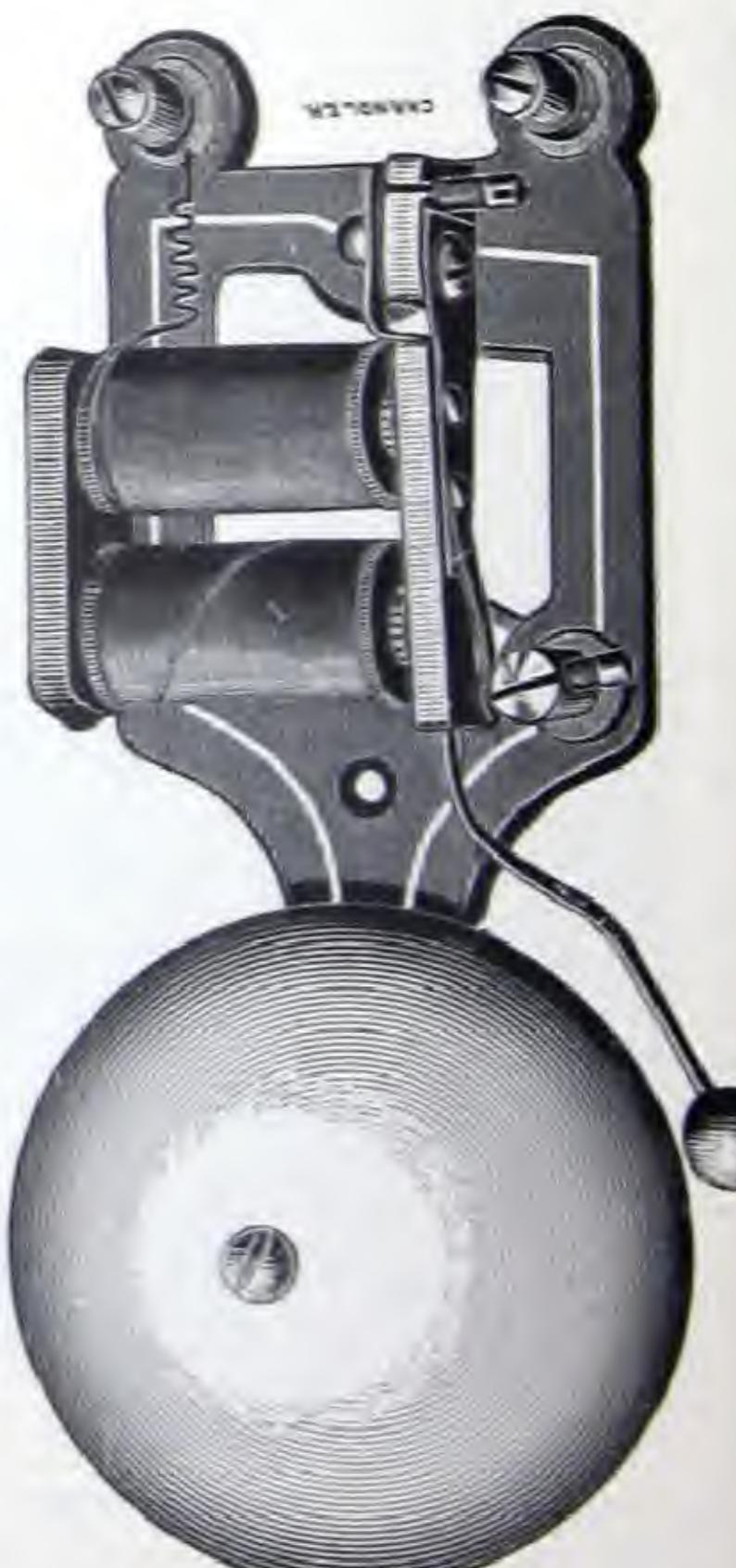
STANDARD PATTERN.

PRICE LIST.

CAT. No.		PRICE.
400.	2 $\frac{1}{2}$ inch Gong	\$.90
401.	3	1.00
402.	3 $\frac{1}{2}$	1.12
403.	4	1.20

Frame is Neatly Japanned and Striped.

GIVE CATALOGUE NUMBERS IN ORDERING.



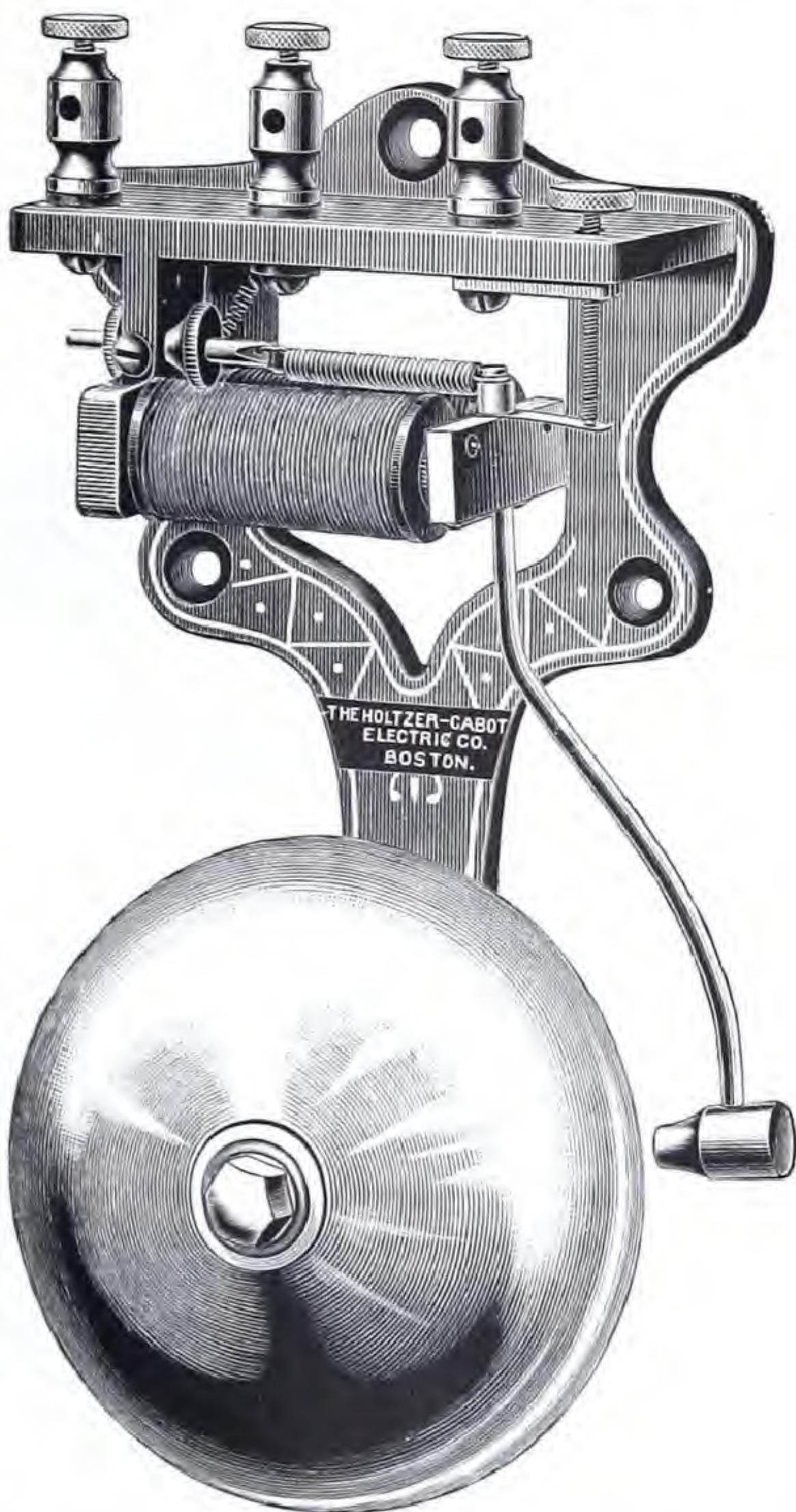
Acme Skeleton Bell.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electric Bells,

THE "BERLIN" BELL.



Single
Stroke.

Continuous
Ringing.

As seen in the cut, this bell has no trunnion screws, the armature being hung on pins protruding from magnet cores. Numerous advantages result from this form of construction, chief among which is the small battery power required to operate it. Connecting to the two binding posts on the left converts it into a single-stroke bell, the two on the right being wired for continuous ringing. Its speed as a vibrating gong may be varied by turning the contact screw. The magnets are wound with silk wire; the frame japanned and ornamented. As a single-stroke bell it has no equal.

PRICE LIST.

CAT. NO.	DIAMETER OF GONG.	PRICE.
466	4 inches	\$4.00
467	6 "	6.30
468	8 "	12.00
469	10 "	16.00

GIVE CATALOGUE NUMBERS IN ORDERING.

...THE HOLTZER-CABOT ELECTRIC COMPANY...

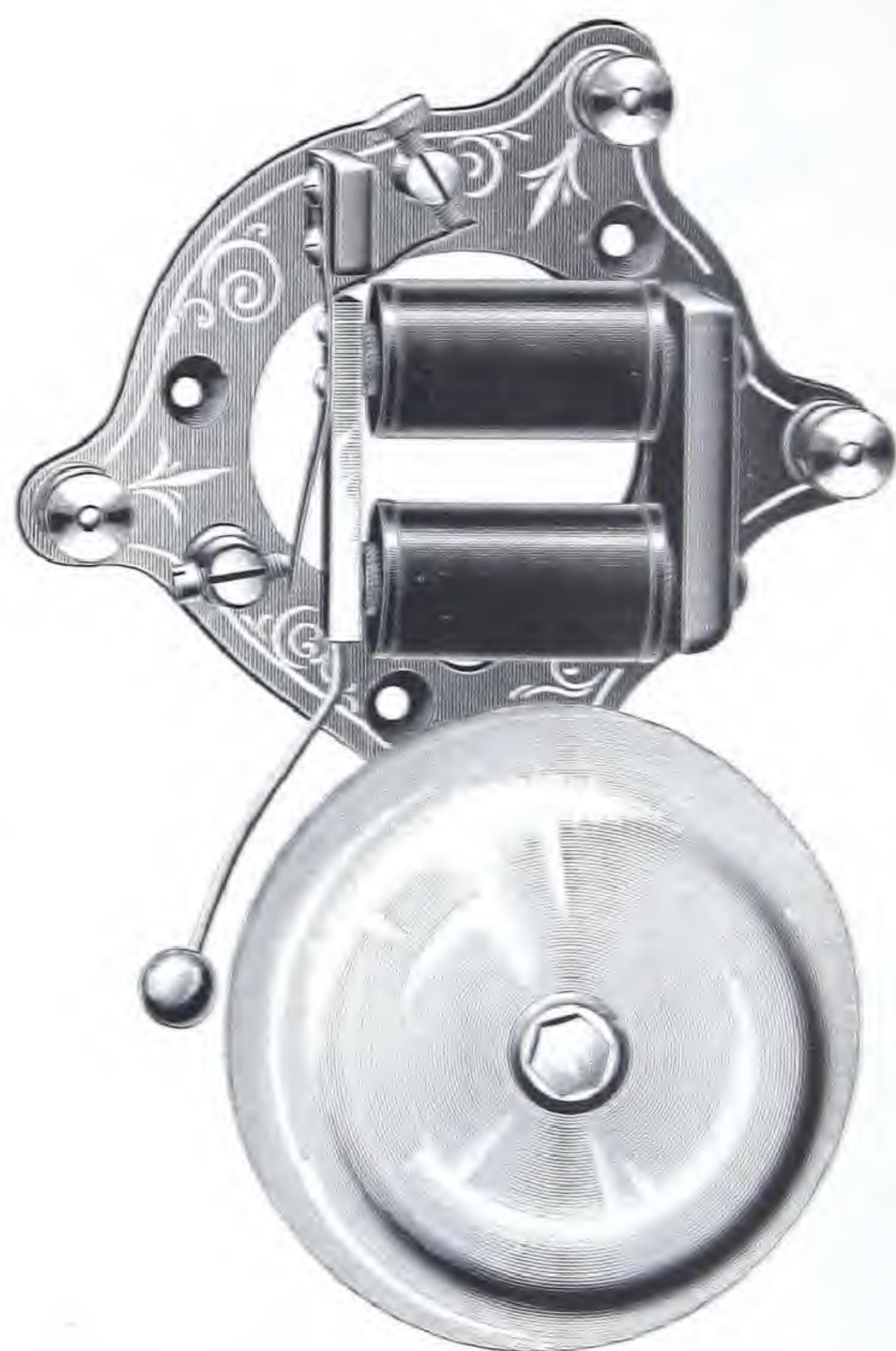
Boston, Mass.

The Holtzer Skeleton Bell.

SINGLE STROKE OR VIBRATING.

FINELY
FINISHED;
CAST GONGS.

MAGNETS
WOUND WITH
SILK WIRE



CAT. NO.

PRICE LIST.

CAT. NO.	PRICE.
416. 4 inch Gong	\$3.50
417. 5 " "	4.00
418. 6 " "	5.25
419. 7 " "	5.75
420. 8 " "	7.00

CAT. NO.	PRICE.
416. 4 inch Gong	\$3.50
417. 5 " "	4.00
418. 6 " "	5.25
419. 7 " "	5.75
420. 8 " "	7.00

SEE ALSO BERLIN BELL, ILLUSTRATED AND DESCRIBED ON PAGE 21.

GIVE CATALOGUE NUMBERS IN ORDERING.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electric Buzzers.

Useful where the tone of an electric bell is too loud or objectionable.

STANDARD WOOD BOX BUZZER.

Identical in construction with our Holtzer Wood Box Bell illustrated and described on page 17.

PRICE.

Cat. No. 424B \$1.12

Made in any wood.



Cat. No. 424B.

THE "HAT" BUZZER.

WOOD OR METAL.

Made in Oak, Walnut, Ash or Cherry, or in Polished Bronze, Nickel, or Brass.

PRICE.

Cat. No. 424. Polished Metal or Wood \$1.00



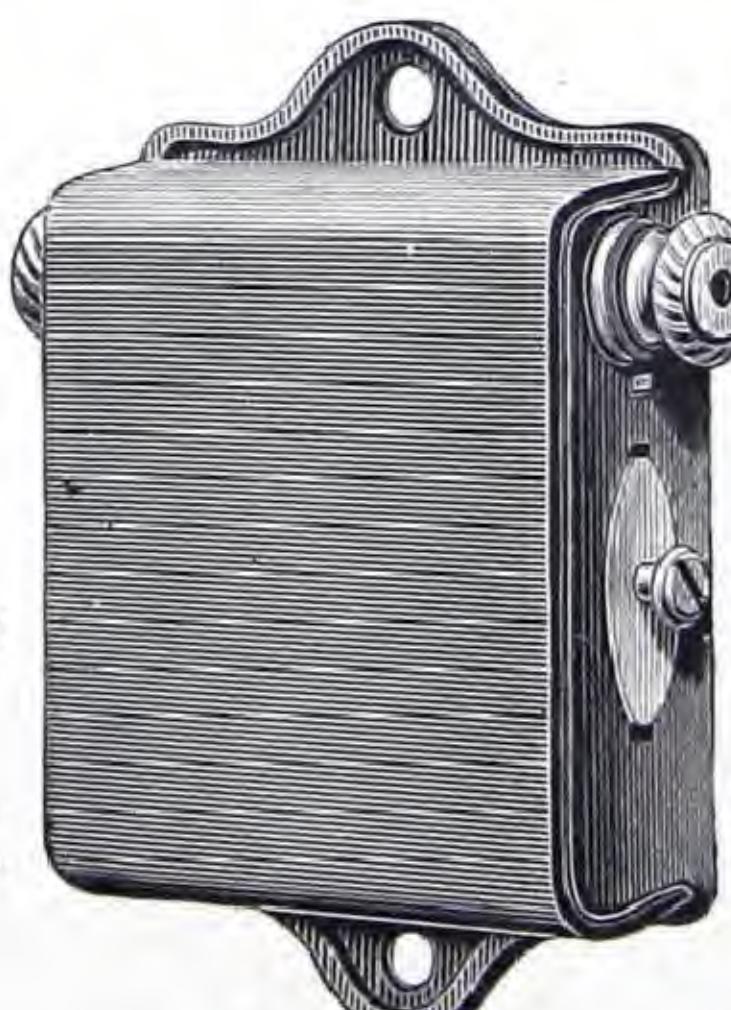
Cat. No. 424.

SMALL NICKEL BUZZER, PATTERN E.

COVER REMOVABLE. VERY NEAT.

PRICE.

Cat. No. 424E \$1.12



Cat. No. 424E.

NOTE.—The tone of the Buzzers here illustrated may be varied by changing their adjustment.

GIVE CATALOGUE NUMBERS IN ORDERING.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Magneto Bells and Testing Generators.

OUR OWN MANUFACTURE.

Of superior workmanship and warranted to ring through resistance designated.

PONY MAGNETOS.

3,000 to 6,000 Ohms.

Bells on Front or Top of Box same Price.

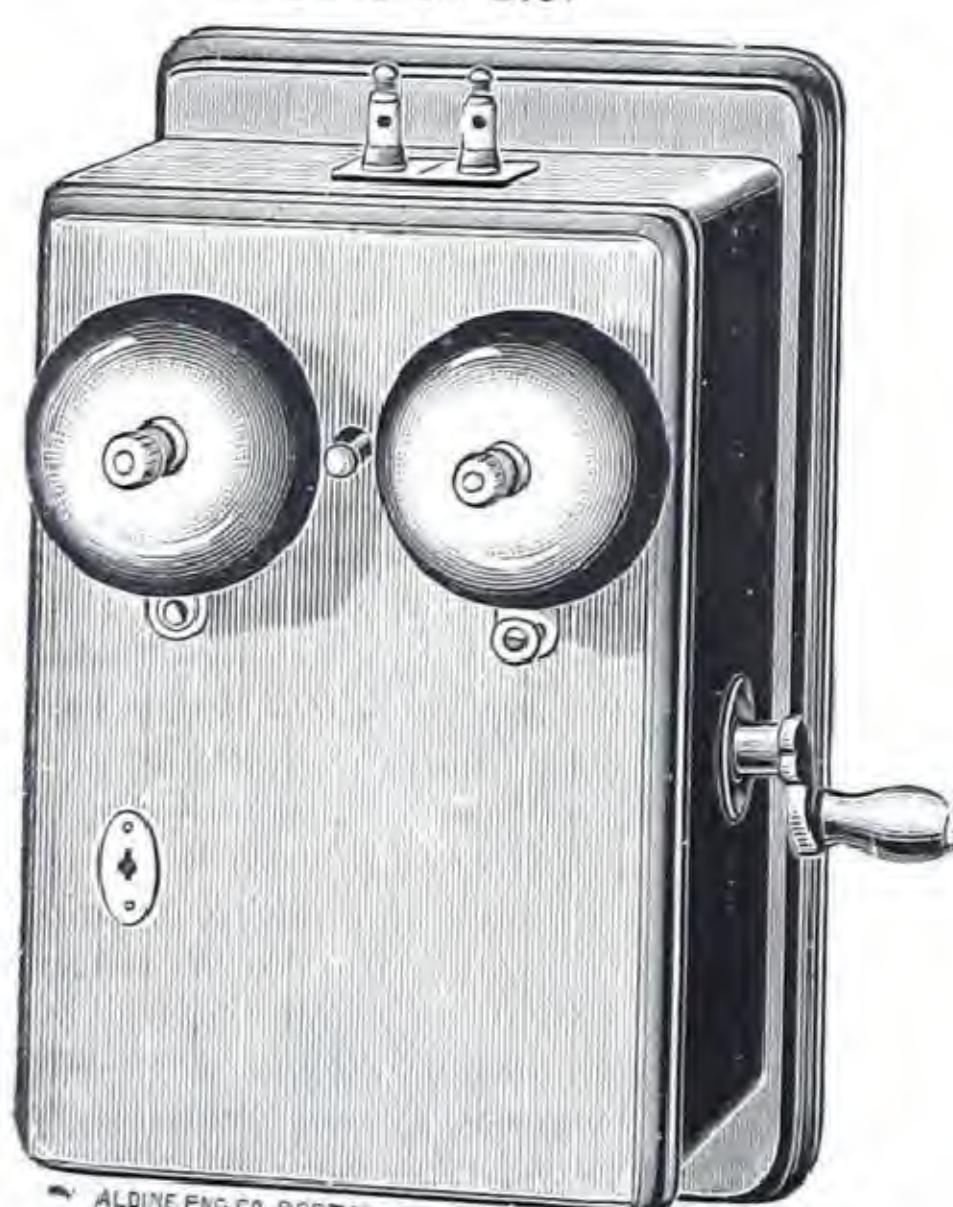
PRICE LIST.

CAT. No.

471. Bells on Cover	\$5.50
471A. " " Top of Box	5.50

Made in Oak, Walnut or Cherry.

Cut of Pony or Standard Magneto
Bells on Lid.



Cat. No. 470 and 471.

STANDARD MAGNETO BELLS.

10,000 to 15,000 Ohms.

If desired, we can wind this bell to ring through any resistance up to 50,000 ohms. A slight advance will be made for bells of special resistance.

CAT. No.

470	PRICE. \$7.50
Oak, Walnut or Cherry.	

TESTING GENERATORS.

15,000 to 50,000 Ohms.

(BELLS INSIDE.)

THE adjacent cut illustrates the interior construction of our magnetos. Please note that we use only cut gears in all styles. Each case has its corners securely locked and is fully polished. Provided with straps for **Linemen's** convenience.

477. 15,000 to 25,000 ohms	\$10.50
477A. 35,000 ohms	12.00
477B. 50,000 "	15.00

Furnished in Oak and Walnut.

ORDER BY CATALOGUE NUMBERS.



Pony Magneto, Bells on Top.
Cat. No. 471A.



Cat. No. 477.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

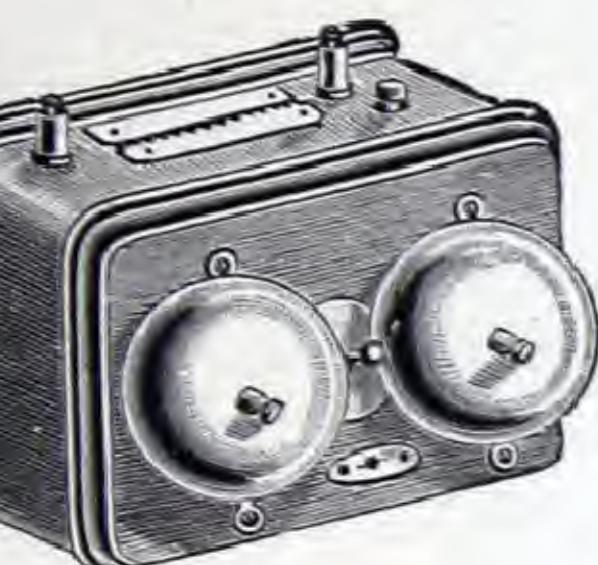
Extension Bells and Magneto Power Generators.

PONY EXTENSION BELLS.

60 Ohms.

When the regular magneto cannot be heard, extension bells are useful as an auxiliary call, and may be placed in any convenient location.

PRICE.



Pony Extension Bell.
Cat. No. 473.

Cat. No. 473	PRICE.
	\$3.00

Made in Oak, Walnut and Cherry woods.

STANDARD EXTENSION BELLS.

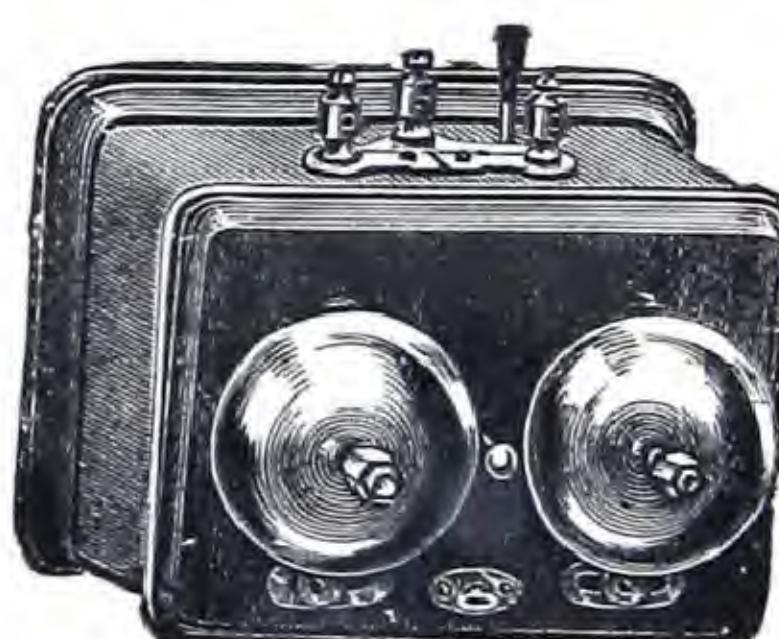
80 to 500 Ohms.

The regular 80-Ohm Extension Bell is all that is needed under ordinary circumstances. Increased resistance of the coils is only advisable for "long distance" use.

PRICE.

Cat. No. 472. 80 ohms	\$3.75
Cat. No. 472A. 500 ohms	6.00

Oak, Walnut and Cherry.



Standard Extension Bell.
Cat. No. 472.

MAGNETO GENERATOR.

Gives a Direct Current equal to about eight (8) cells of our Cylinder Battery.

Employed wherever batteries are objectionable, and adapted to ringing bells and open circuit work.

Made in two sizes, Pony and Standard.

PRICE.

Cat. No. 474. Standard Generator	\$5.00
Cat. No. 475. Pony Generator	4.50

Cat. No. 474.



GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

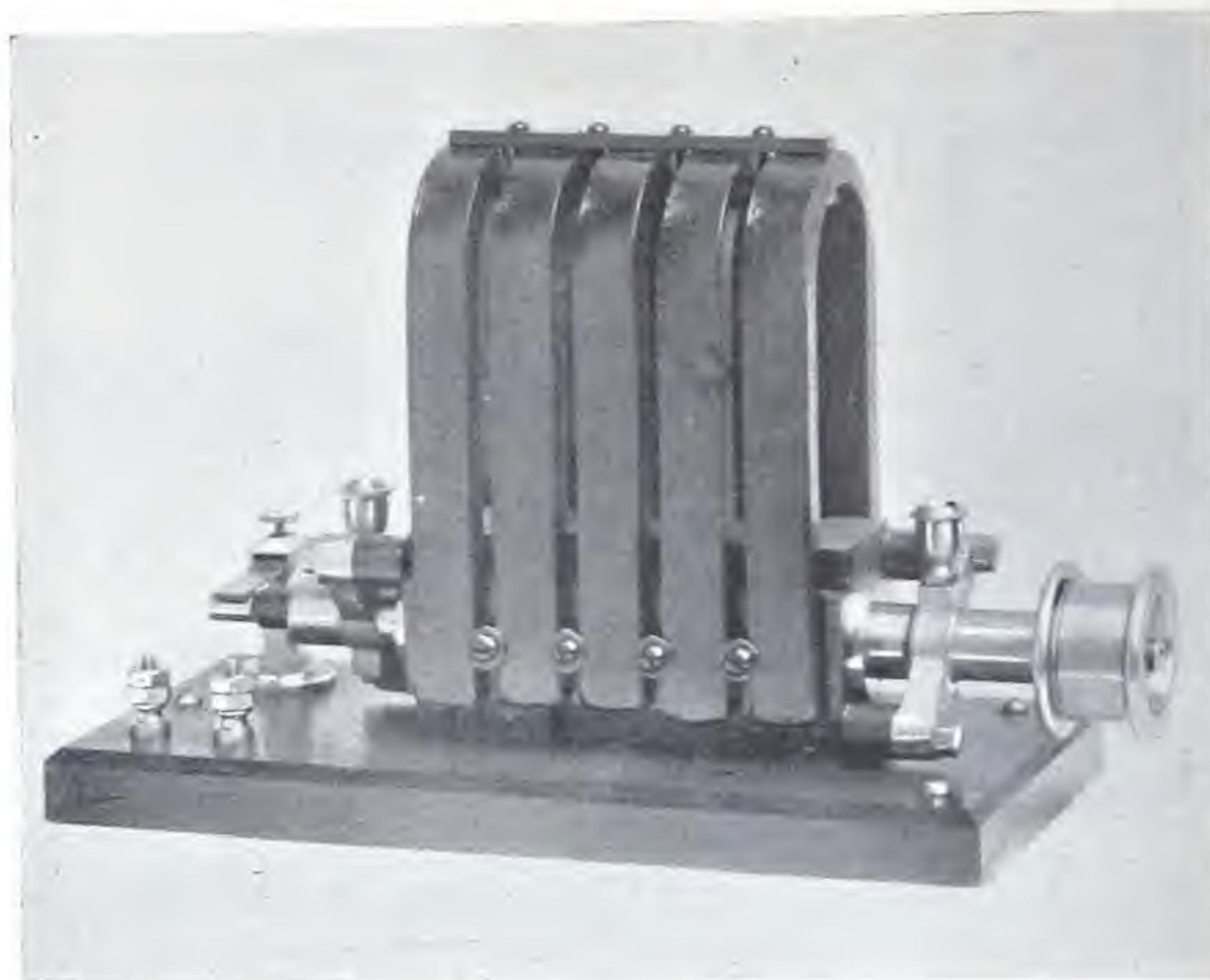
Boston, Mass.

Power Magneto Generator.

For
Telephone
Exchanges,
Testing
Purposes,
or
wherever
Alternating
Currents are
frequently
used.

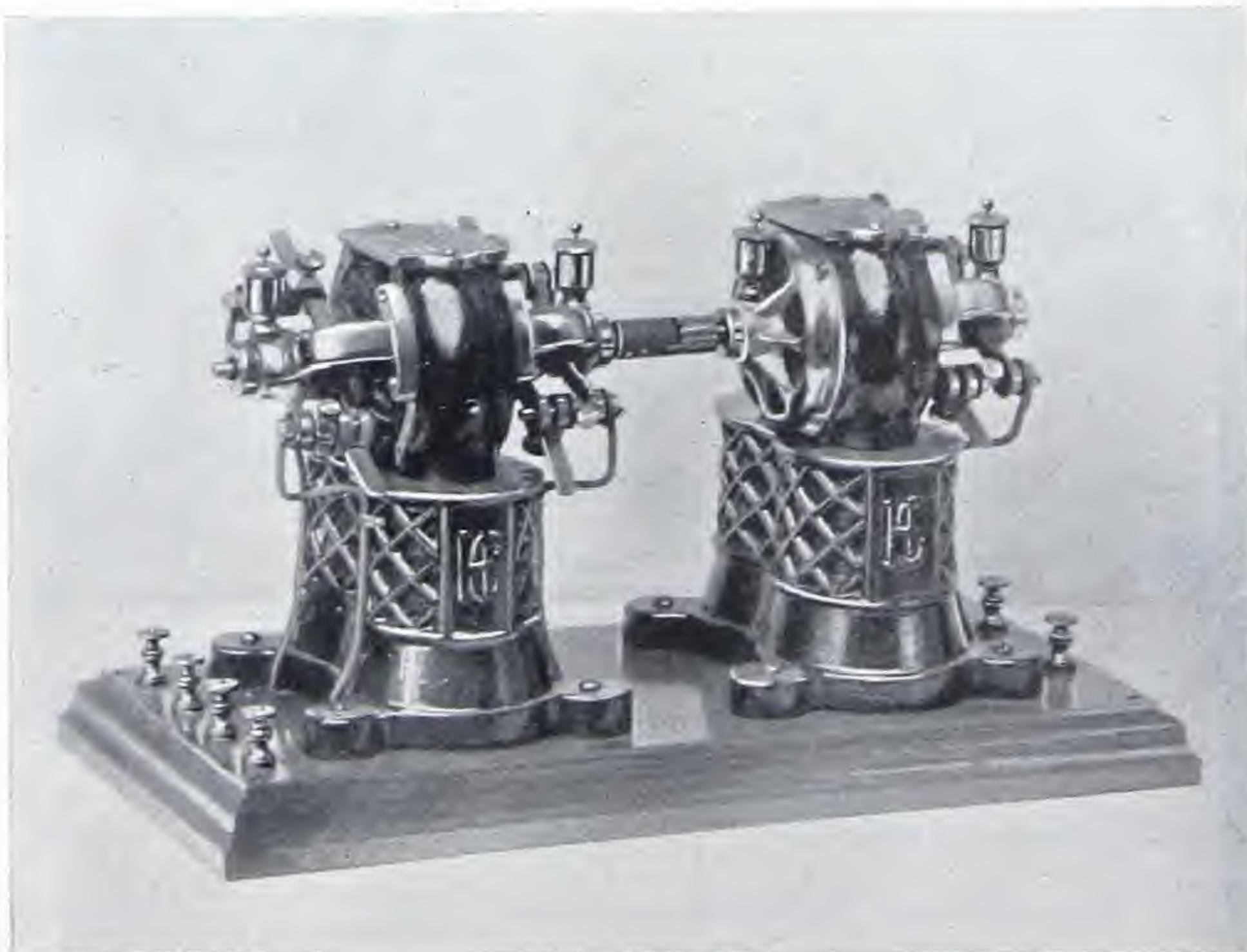
A
Very
Powerful
Machine.

Sub-
stantially
Made.



Price, as per illustration \$60.00

Direct Coupled Magneto Motor Generator.



DESCRIPTION.

This machine consists of one of our M 00, Direct Current Motors directly coupled to one of the same machines furnished with a Ring Collector and wound as a Generator. By coupling the latter with one of our Alternating Motors, it may be operated from ordinary Transformer Currents.

PRICE.

Motor Generator, as per cut, adapted to be driven by A. C. or Direct Currents, 110 or 220 Volts, \$75.00
500 Volt Motor Generator 90.00
Prices of larger sizes on application.

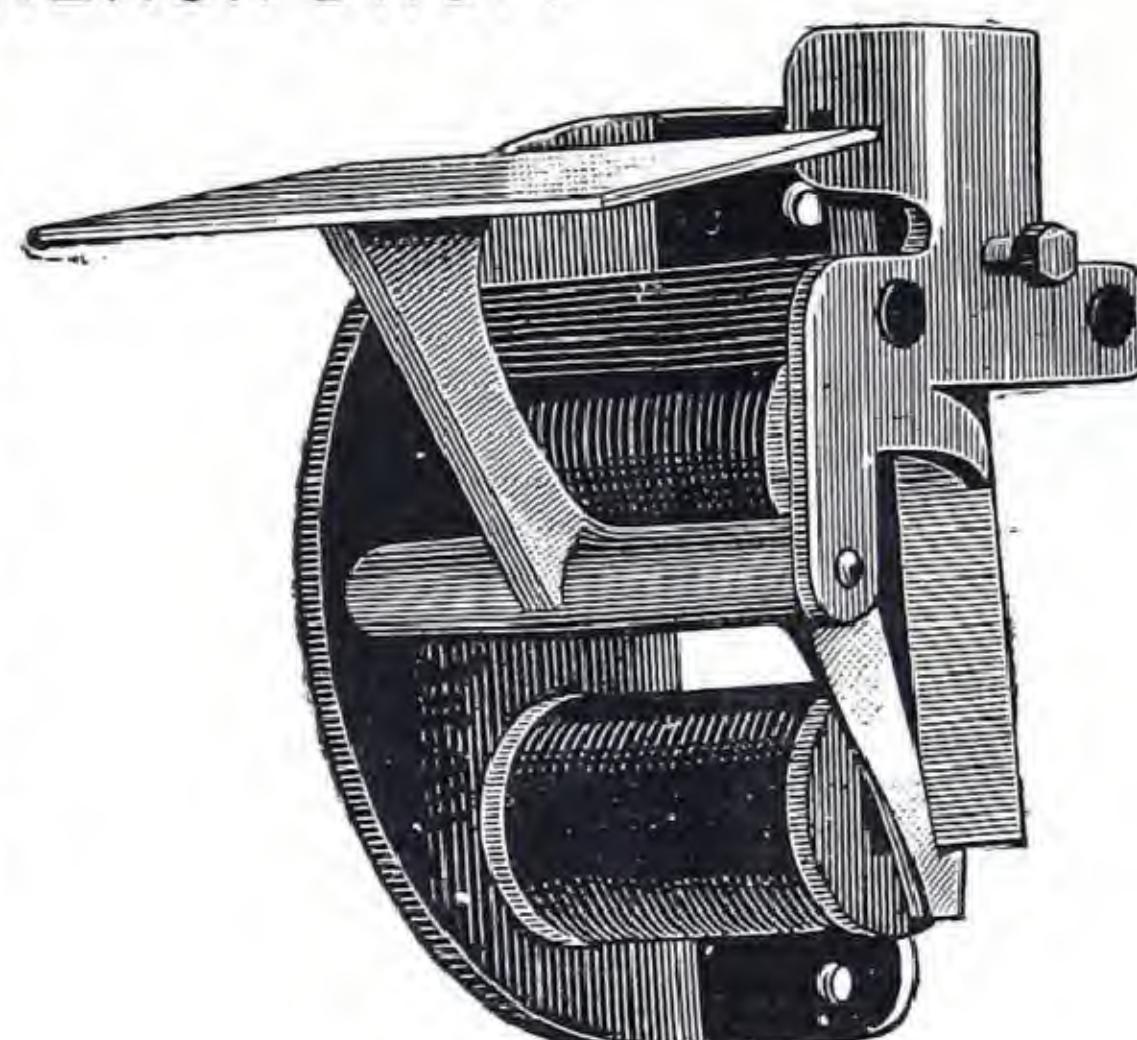
....THE HOLTZER-CABOT ELECTRIC COMPANY. .

Boston, Mass.

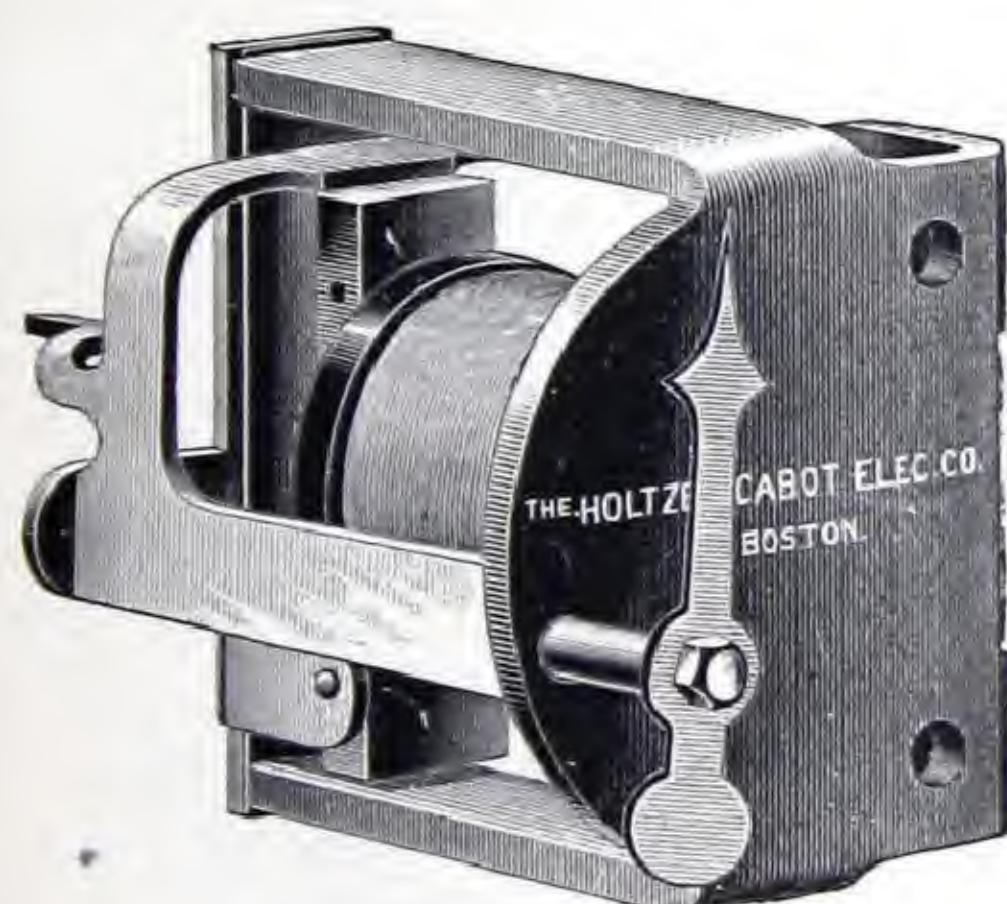
Hotel and House Annunciators.

GRAVITY, NEEDLE OR FRENCH DROP.

UR Gravity Annunciators are simple in construction and positive in action. The drop is not complicated by springs, etc., as the armature supports the shutter arm. The checking is accomplished by a mechanical set-back. They are specially suitable for Railway or Steamer work, as this drop may be adjusted to withstand severe shocks.



Gravity Drop.



Needle Drop.

FRENCH OR PERMANENT MAGNET ANNUNCIATORS.

The law that "like poles repel" is advantageously used in the construction of these machines. When operated a white *disc* appears under the number of the room that signals. The drops are checked electrically by reversing the polarity of the batteries, and this checking button may be placed in any convenient position.

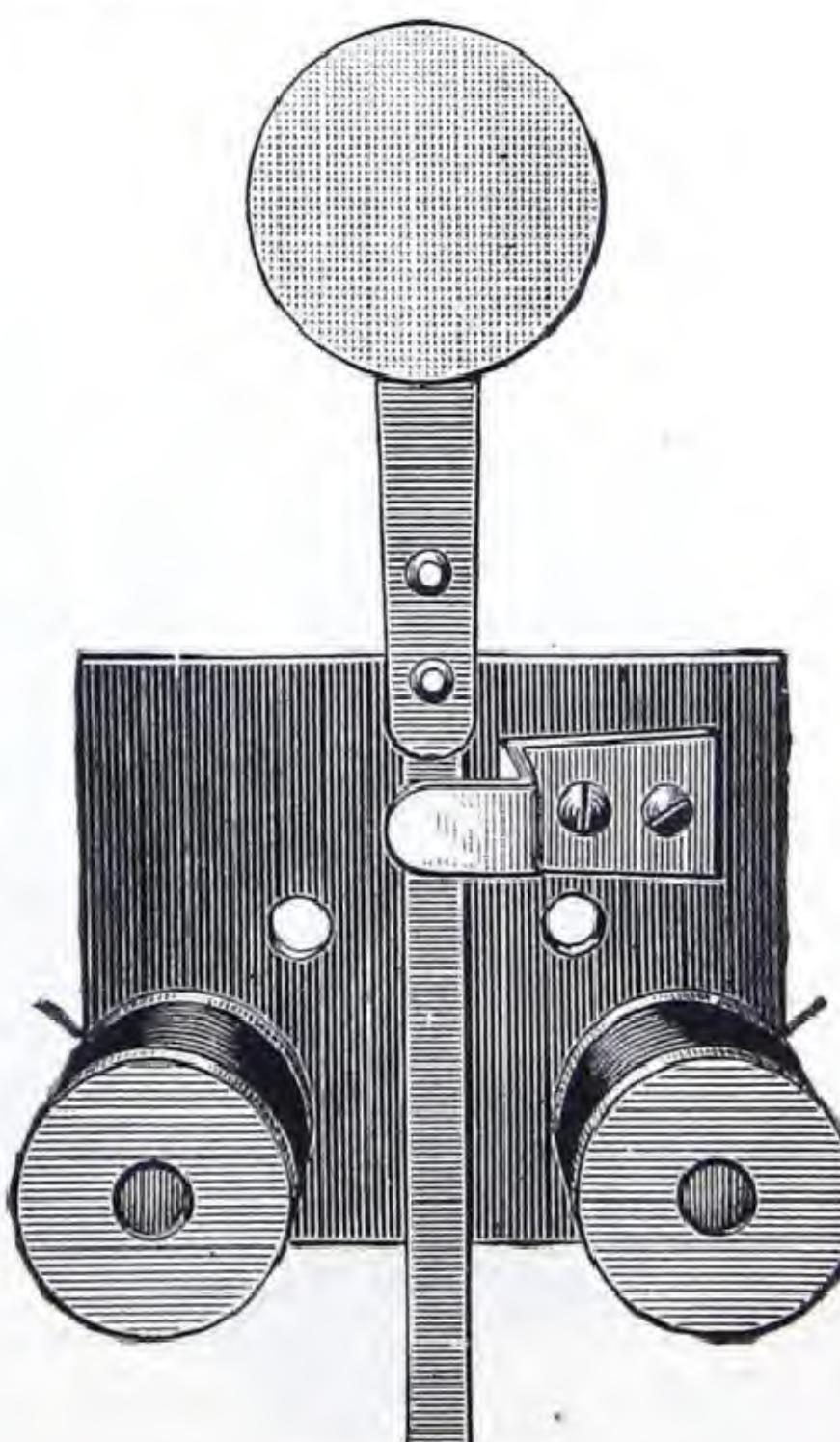
WE FULLY WARRANT

this style of Annunciator, and can refer to many that have seen years of service with a minimum expense for repairs.

PRICE OF DROPS ONLY.

Annunciator Drops (three styles same price) . . . 75 cents each.

SPECIAL NOTICE.—Prices given for Hotel and House Annunciators are for ordinary woods, such as Ash, Oak, Walnut and Cherry. Other woods or Special Patterns will be charged at a reasonable advance.



French Drop.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Return Call Annunciators.

WITH FIRE-ALARM SWITCH.

Description.

WE manufacture a system of our own, combining the ordinary annunciator with a **Call Board**, making possible to signal from room to office and vice versa. The Return Call Bells illustrated and described below are used in this system and a full diagram of wiring is given on page 29. We can furnish separate Return Call Boards with Fire-Alarm Switch to hotels, etc., already equipped with Annunciators.

We do not advocate the use of Return Call Bells as a Fire-Alarm system. They may be mistaken for a Guest Call Electro-Mechanical Gongs cannot be misinterpreted as they continue to ring until 400 blows are struck. By their use the expense of battery is decreased.

Metal Return Call Bell.



Cat. 101A.

Combination Return Call Bells and Buttons.

PRICE LIST.

CAT. NO.

101A. Metal Combination Bell
and Button, dark bronze
or nickel finish, . . . \$1.45

CAT. NO.

101. Wood Combination Bell,
each \$1.45

Wood Combination
Bell.



Cat. No. 101.

GIVE CATALOGUE NUMBERS
IN ORDERING.

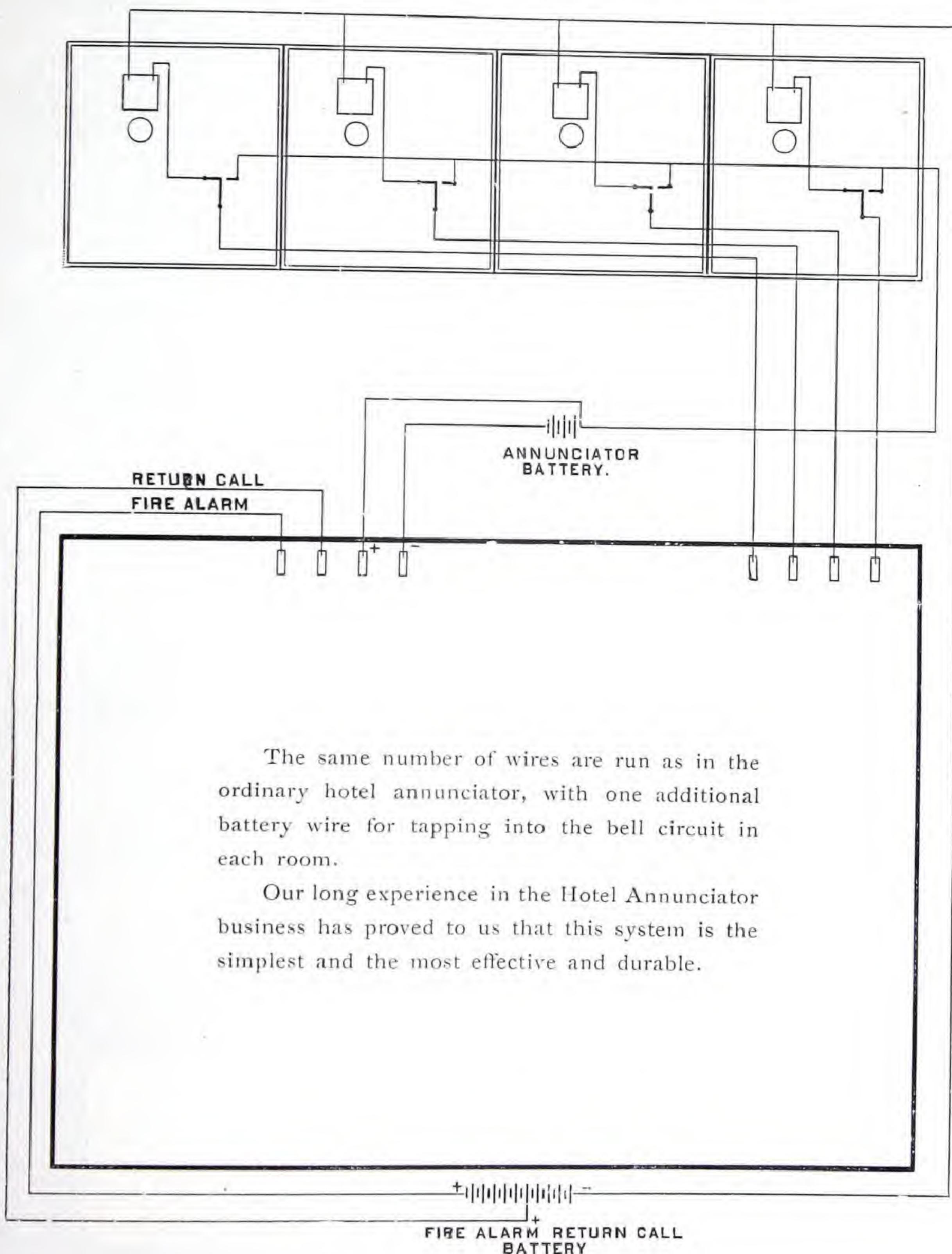
...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Diagram of Wiring

FOR

RETURN CALL ANNUNCIATORS.



The same number of wires are run as in the ordinary hotel annunciator, with one additional battery wire for tapping into the bell circuit in each room.

Our long experience in the Hotel Annunciator business has proved to us that this system is the simplest and the most effective and durable.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

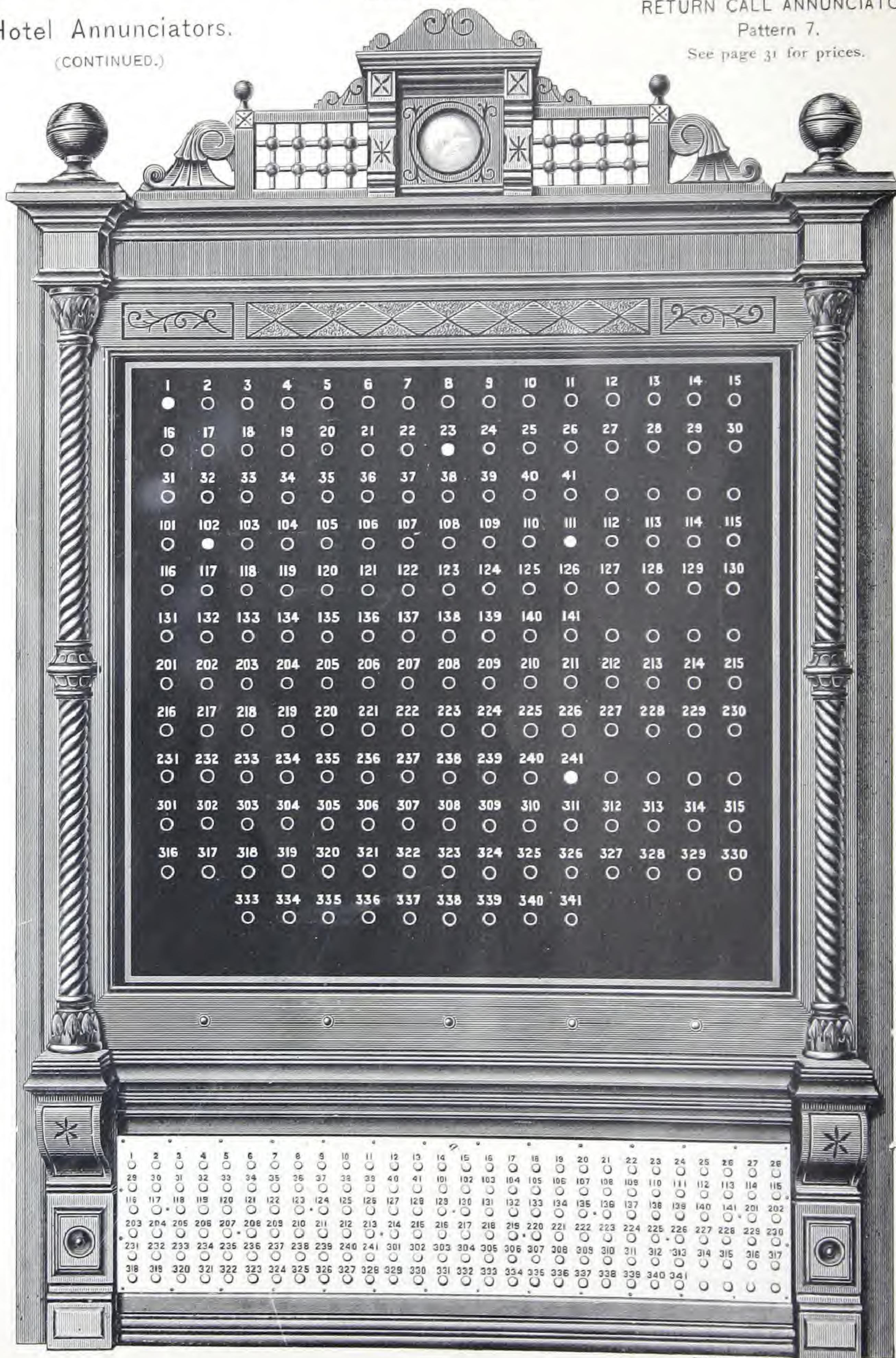
Hotel Announciators.

(CONTINUED.)

RETURN CALL ANNUNCIATOR

Pattern 7.

See page 31 for prices.

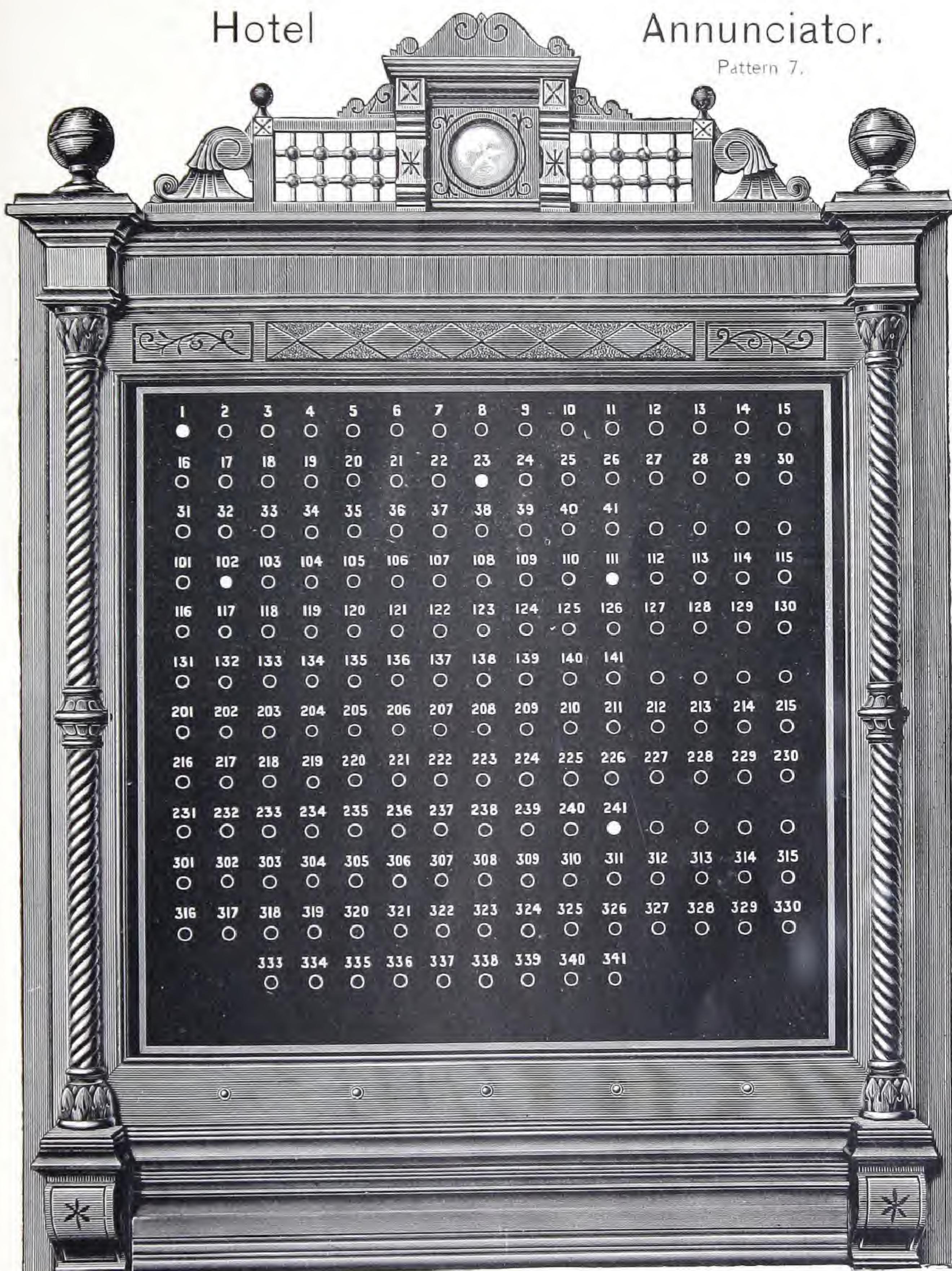


BUNNAR & CHAPIN, LTD

Hotel

Annunciator.

Pattern 7.



Made either Gravity Drop, French or Needle, at same price.

CAT. NO.		PRICE.
102.	Hotel Annunciator, 50 to 100 indications	\$1.65 per No.
"	above 100 "	1.50 "
103.	" " and Return Call, 50 to 100 indications	2.55 "
"	" " " above 100 "	2.40 "
104.	Return Call Board, only (for Hotels already supplied with Annunciator)	.90 "

Case Elaborate and Finely Finished.

ORDER BY CATALOGUE NUMBERS ONLY.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Hotel Annunciators.

(CONTINUED.)

PATTERN 15.



THE case of this machine is elegantly polished. Its hard oil finish will compare favorably with that of the rich wood work now found in finely decorated interiors.

Prices same as Pattern 7, see preceding page.

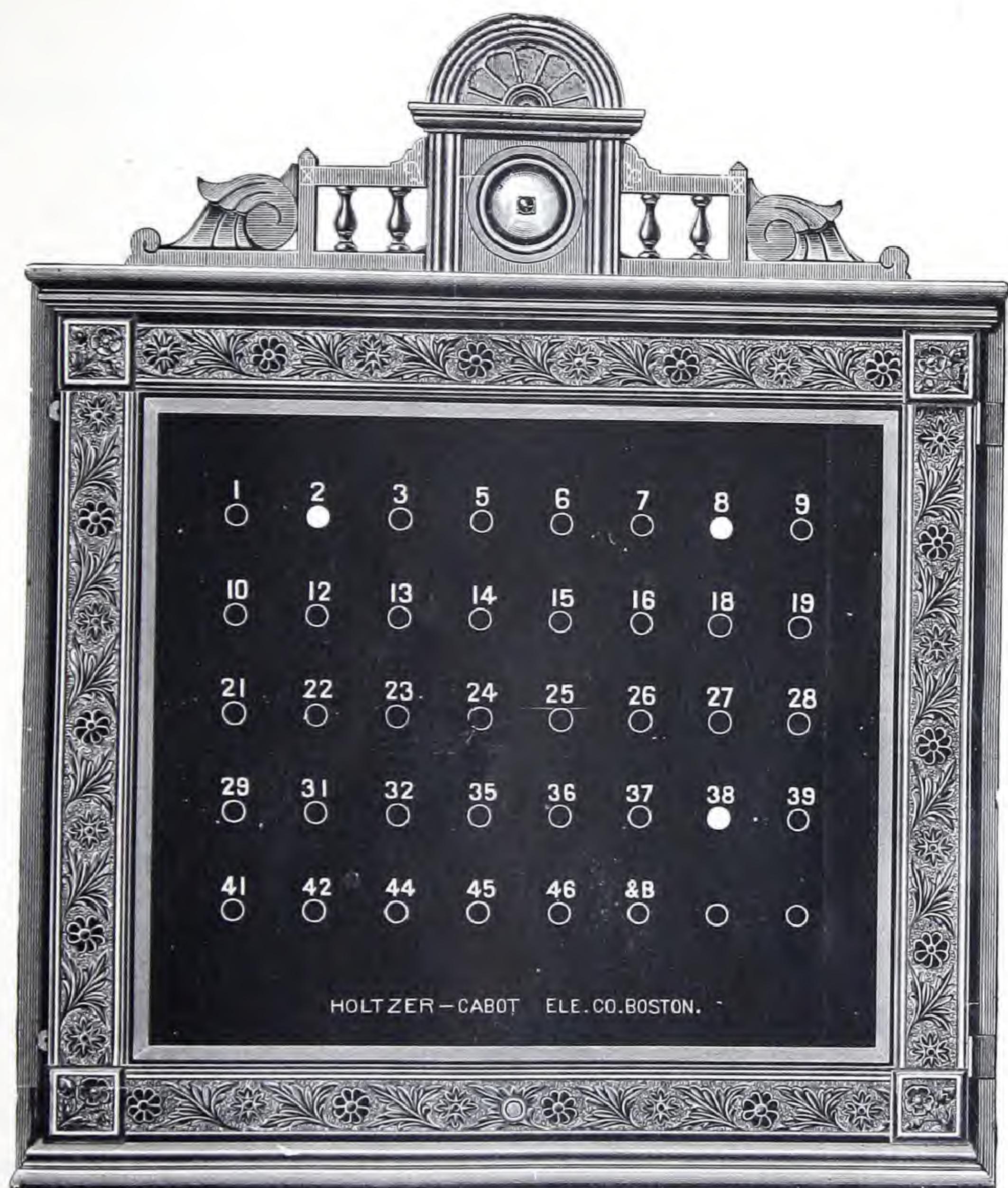
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Hotel Annunciators.

(CONTINUED)

PATTERN 6.



Made either Gravity Drop, French or Needle, at same price.

PRICE LIST.

PRICE.
\$1.65 per No.
50 indications and above " " 1.50 "
30 to 50 indications and Return Call combined " " 2.40 "
50 indications and above " " 2.25 "

A Very Handsome Case.

ORDER BY CATALOGUE NUMBERS ONLY.

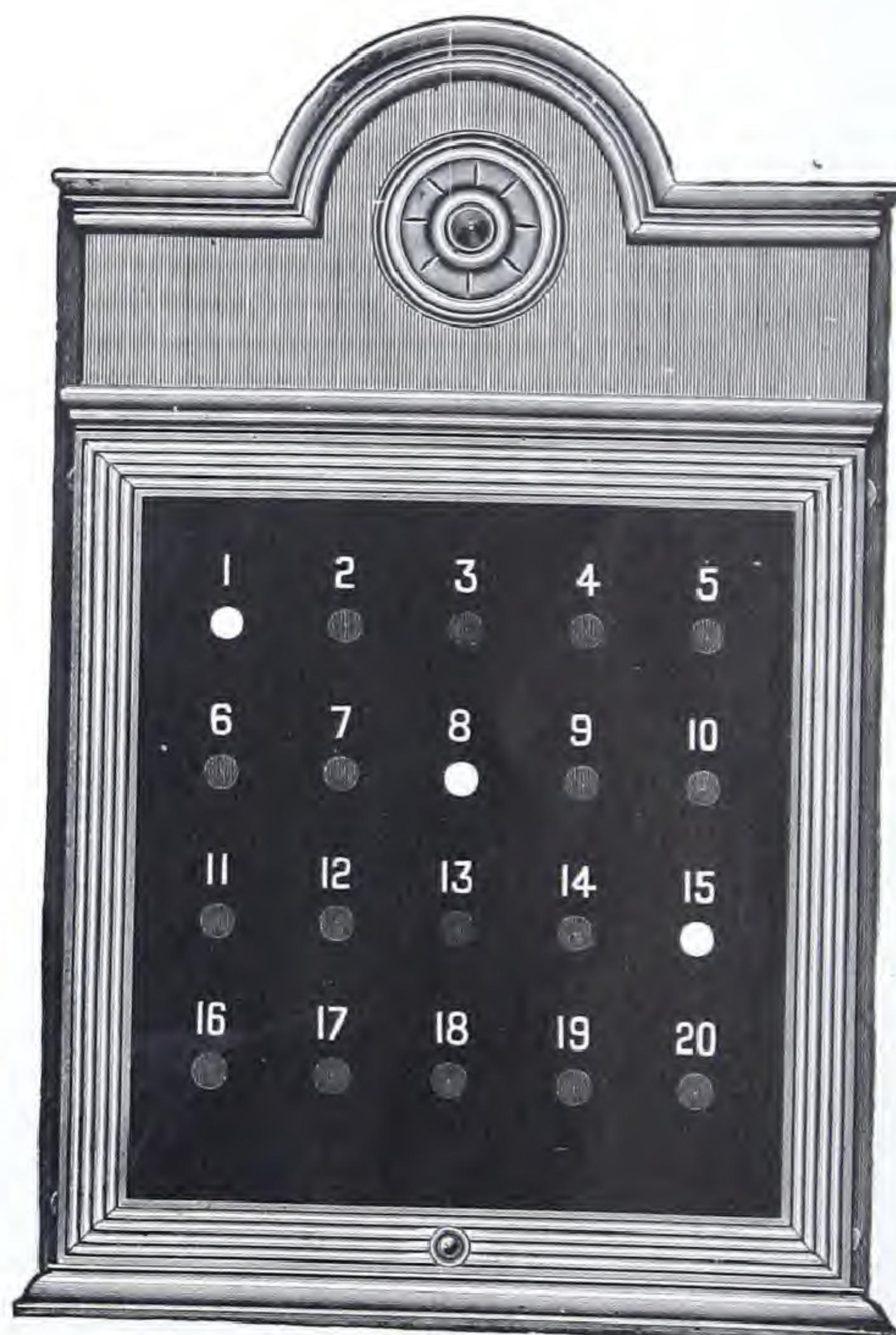
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Hotel Annunciators.

PATTERN 3.

Pattern 3 Hotel Annunciators not made in sizes above 75 Indications.



PRICE LIST.

CAT. NO.

110. 30 to 50 indications, per number, including Bell

50 indications and above, per number

PRICE.

\$1.50

1.35

Add 75 cents per number for Return Call Board and Fire Alarm.
Gravity, French or Needle Drop, at same price.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electric Want Indicator.

MAY BE ATTACHED TO ANY ANNUNCIATOR ALREADY IN USE.

Made in any Wood.



Cat. No. 24.

WANT Indicators are placed in the return battery circuit of Hotel Annunciators. On a cylinder are placed nine names indicating the most common wants of the guests. Each pressure on the push button in a room causes this cylinder to revolve and show the names in their regular rotation.

A card is placed in each room under push button with the following calls printed thereon:

Press once for Bell Boy; twice for Ice Water; three times for Hot Water; four times for Chambermaid; five times for Porter; six times for Towels; seven times for Writing Material; eight times for Carriage; nine times for Bath. Other names painted on indicator as desired.

This instrument may also be used as a stable or janitor call, or wherever not more than nine indications are needed.

PRICE	.\$22.50
-------	----------

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

House Annunciators.

NEW TRADE PATTERN NO. 25.

GRAVITY DROP ONLY.



CAT. NO.

PRICE LIST.

	PRICE.
160. 3 Numbers Complete	\$6.00
161. 4 " "	6.75
162. 5 " "	8.25
163. 6 " "	9.75
164. 8 " "	11.75
165. 10 " "	14.75
166. 12 " "	17.75

In Oak, Ash, Walnut and Cherry Woods. Other Woods at an advance price.

READ CAREFULLY BEFORE ORDERING.

All Annunciators are numbered and lettered as desired. Customer's name and address in gold without extra charge. In ordering Gravity Annunciators, specify whether round or square openings in the glass are wanted, and whether name should be on glass or on face of drop. State also pattern of frame; kind of wood; number of drops; and whether Gravity, French or Needle Drop is desired.

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

House Annunciators.

(CONTINUED.)

GRAVITY AND NEEDLE DROP ONLY.

Pattern No. 3 Frame.

Frames Made in Oak, Ash, Walnut
or Cherry.

Well Finished and Fully Warranted.

ALL
ANNUNCIATORS
Numbered and
Lettered in Gold,
with
Customer's
Name and Address,
without
extra charge.

PRICE LIST
Of Pattern No. 3 Annunciator.

CAT. No.		PRICE.
148.	3 Numbers Complete	\$8.25
149.	4 "	9.00
150.	5 "	10.50
151.	6 "	12.00
152.	8 "	15.00
153.	10 "	18.00
154.	12 "	21.00
155.	16 "	27.00
156.	20 "	33.00



GIVE CATALOGUE NUMBERS IN ORDERING.

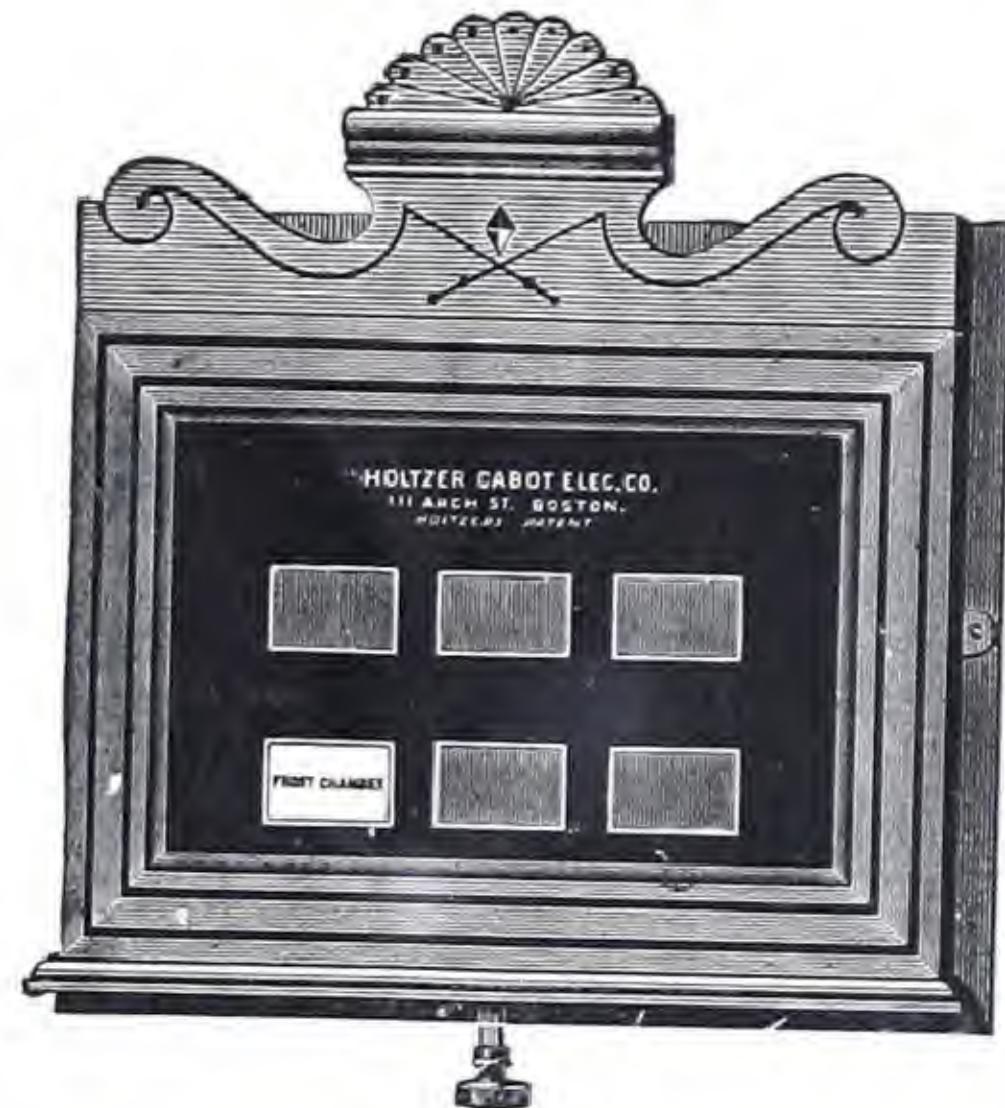
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

House Annunciators.

(CONTINUED.)

Patterns 20, 21 and 22.



Pat. 22.

NEEDLE, GRAVITY OR FRENCH
DROP.

PRICE LIST.

Patterns 20, 21 and 22

Same Price.

CAT. NO.

CAT. NO.	PRICE.
125. 3 Numbers Complete	\$6.75
126. 4 " " " "	7.50
127. 5 " " " "	9.00
128. 6 " " " "	10.50
129. 8 " " " "	13.50
130. 10 " " " "	16.50
131. 12 " " " "	19.50

GIVE CATALOGUE NUMBERS IN ORDERING.

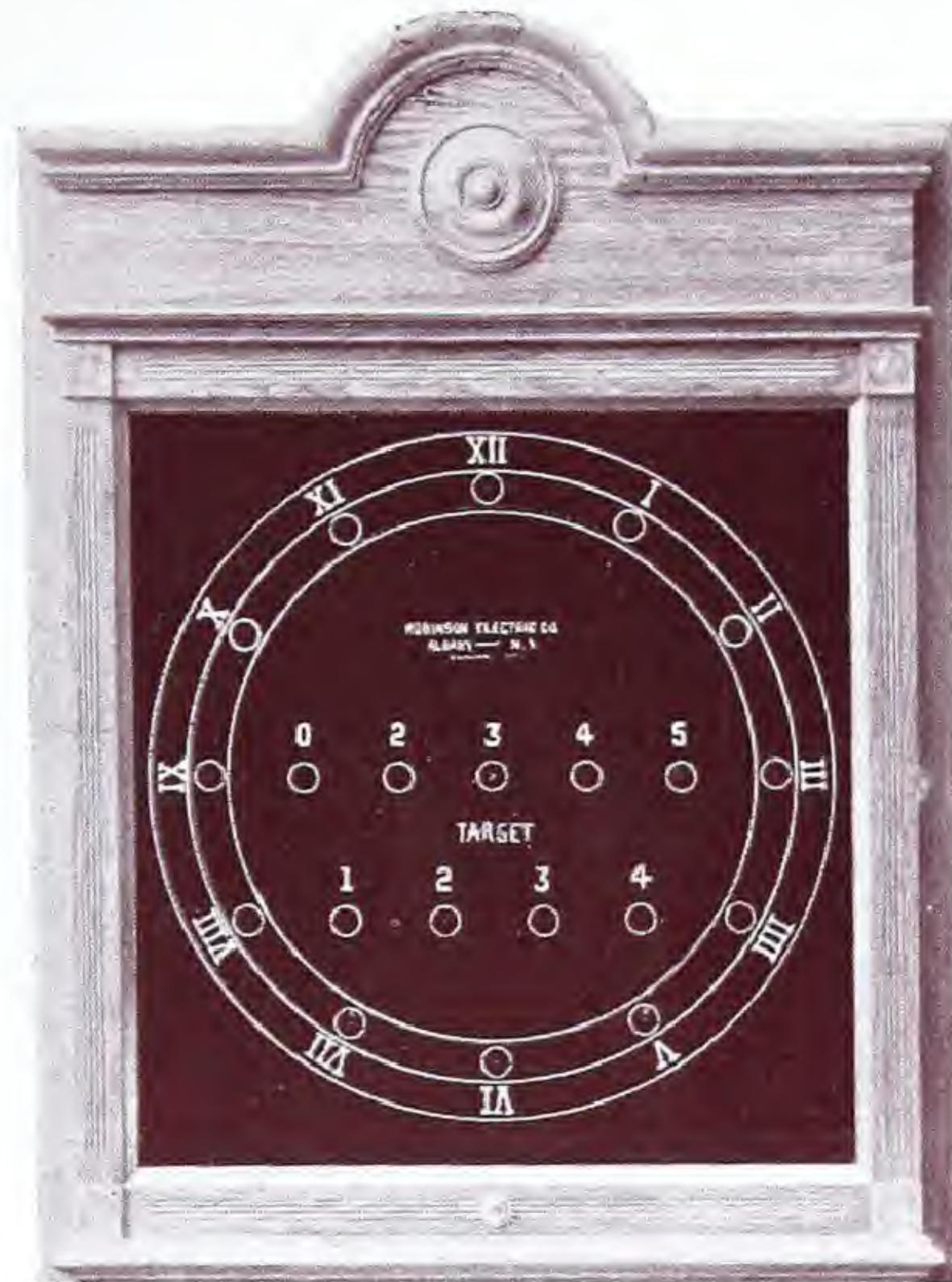


Pat. 21.



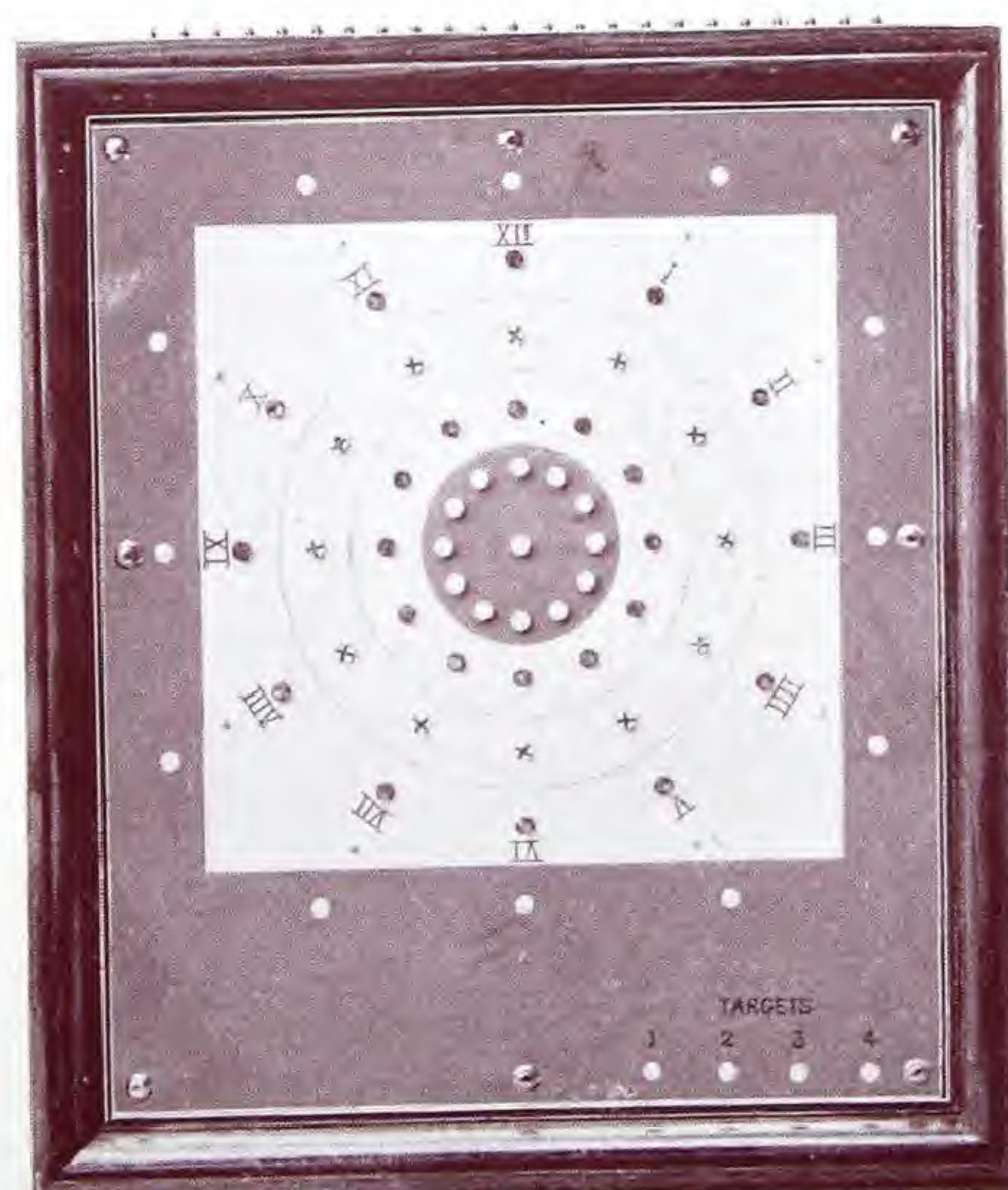
Pat. 20. French Drop.

Special Target Annunciator.



PRICE.

Target Annunciator, with Button Board, \$125.00.



DETAILED INFORMATION ON APPLICATION.

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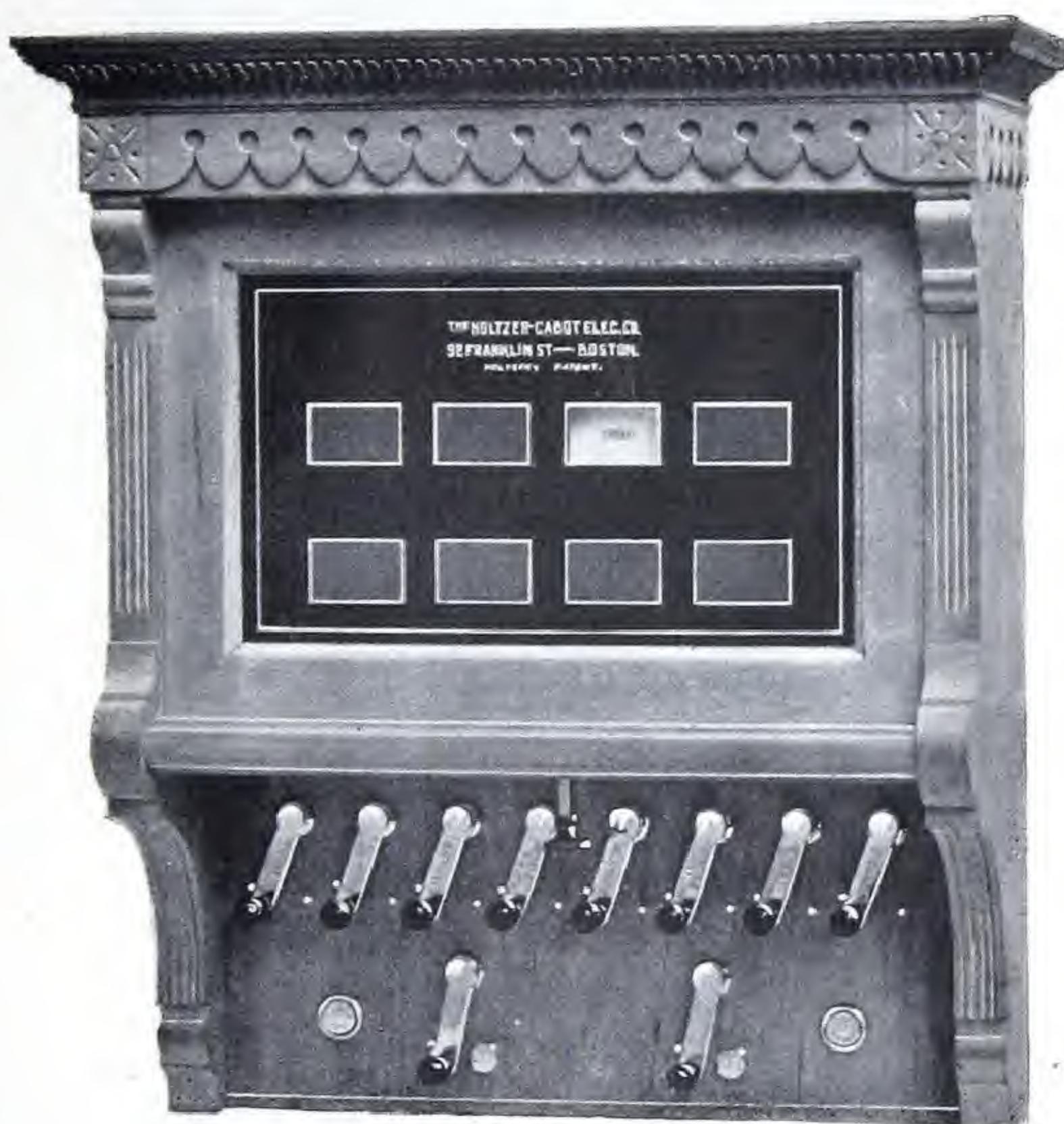
CCA

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Burglar Alarm Annunciators.

Pattern 3 A.



CASES made to order of any finish, the grain of the wood being filled and well polished. **Silent Test, Battery Test and Constant Ringing Attachment** on all instruments.

CAT. No.	PRICE LIST.	PRICE.
320A.	4 Indications Complete	\$18.00
321A.	6 " " " " .	22.00
322A.	8 " " " " .	26.00
323A.	10 " " " " .	30.00
324A.	12 " " " " .	34.00
325A.	14 " " " " .	38.00

GIVE CATALOGUE NUMBERS IN ORDERING.

THE MOLTZER-CAROT ELECTRIC COMPANY.

Boston, Mass.

Burglar Alarm Announciators.

CONTINUED.

Pattern No. 10, with Pendulum Clock. All Latest Attachments.



Battery Test.

Servants' Call.

Silent Test.

Sectional Cut-Out.

Gravity Door Only.

PRICE LIST.

Order No.	Price.
280. 4 Numbers Complete	\$40.50
281. 6	46.50
282. 8	52.50
283. 10	58.50
284. 12	64.50
285. 14	70.50

Automatic Gas Lighting Attachment furnished for \$5.00 extra.

MENTION CATALOGUE NUMBERS IN ORDERING.

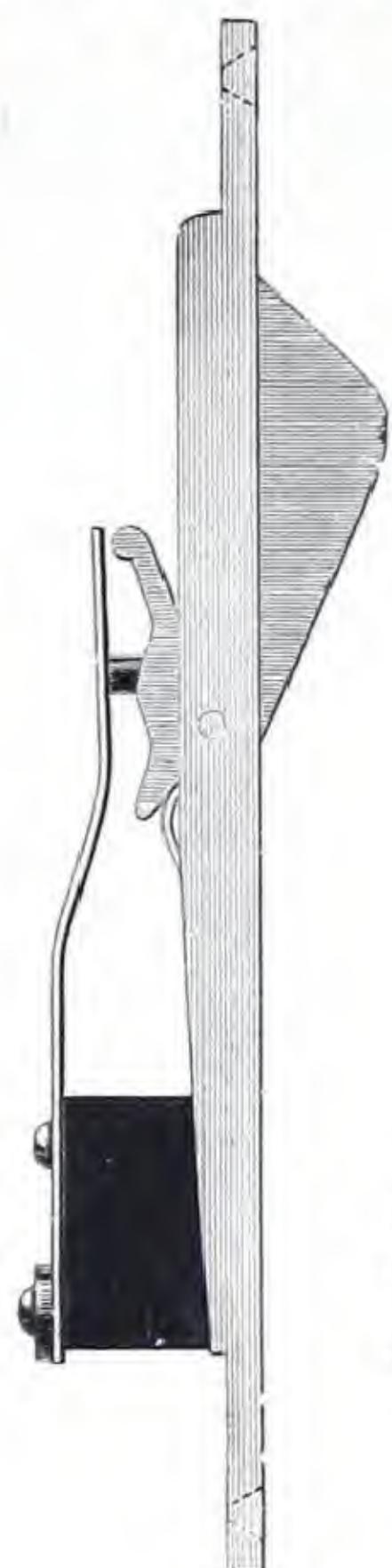
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Door and Window Burglar Alarm Connections.

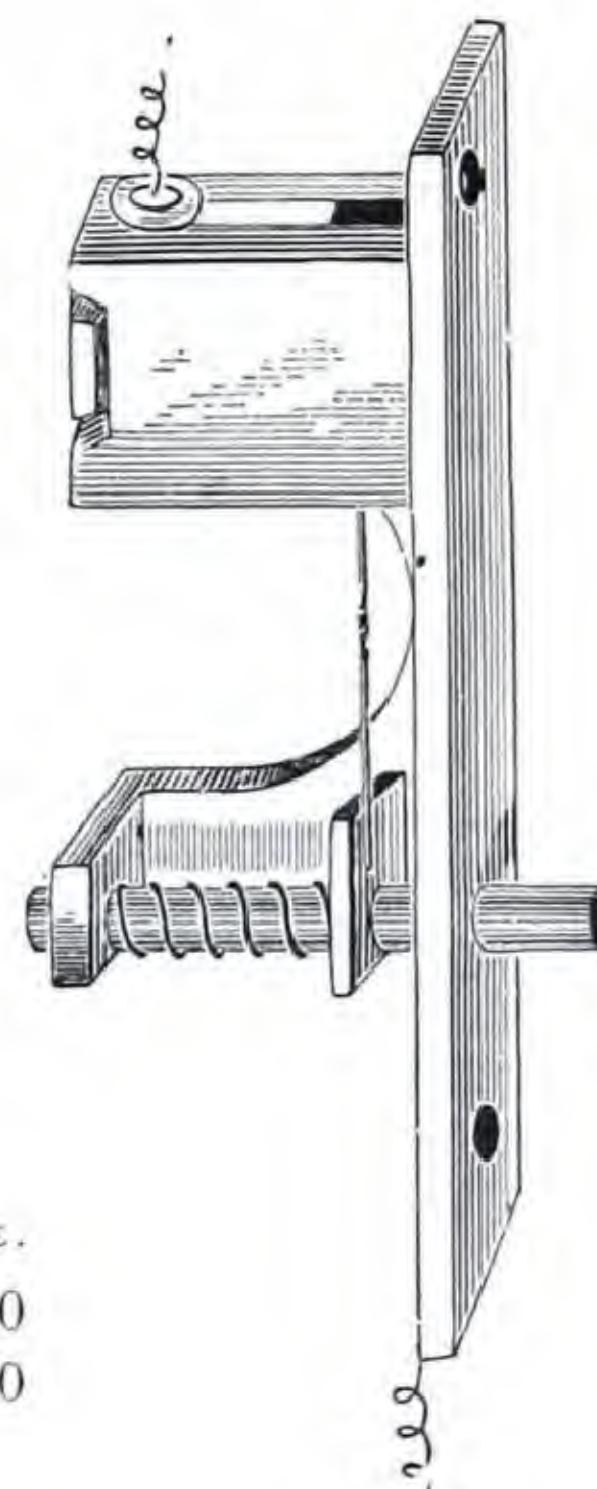
SINGLE
WINDOW
CONNECTOR.

STRONGLY MADE.



DOOR
CONNECTOR.

REGULAR PATTERN.

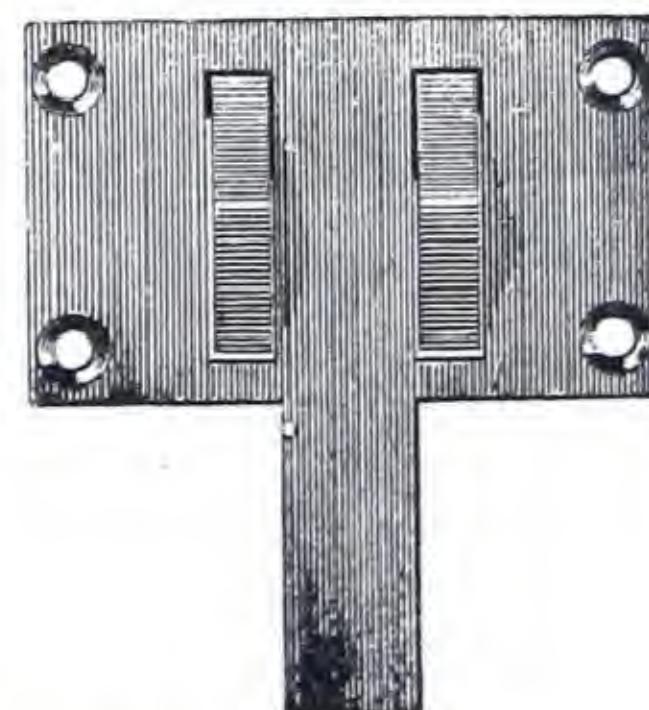


ORIGINAL DOUBLE WINDOW CONNECTOR.

One Connector answers for Both Sashes.

CAT. No.

CAT. No.	PRICE.
343. Each	\$.25
344. Per 100	23.00



OUR "BABY" DOOR CONNECTOR.

Small in size, but very strong.



CAT. No.	PRICE.
341. Each	\$.30
341. Per 100	24.00

GIVE CATALOGUE NUMBERS IN ORDERING.

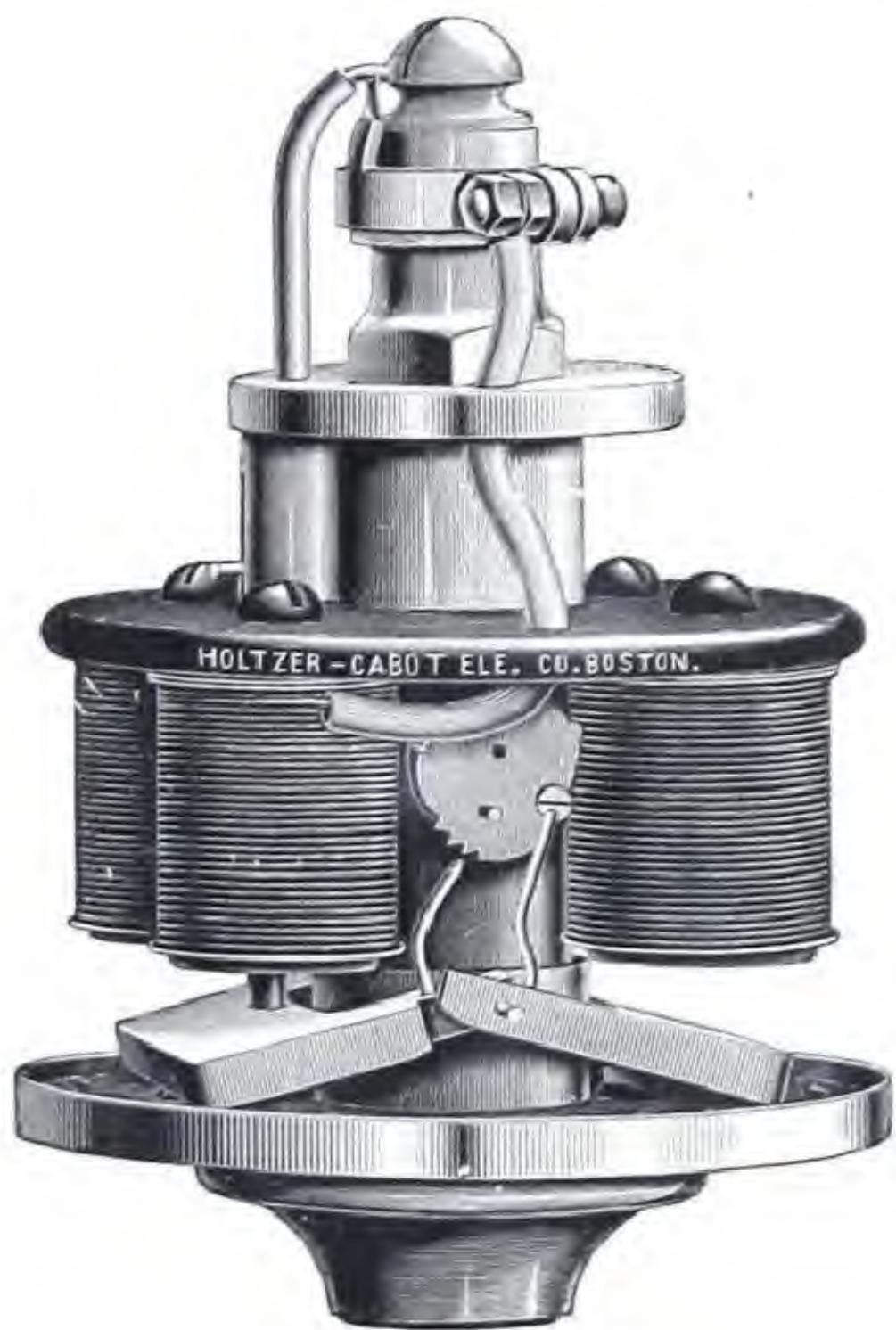
...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Gas Lighting Supplies and Material.

THE HOLTZER AUTOMATIC BURNER.

(PATENTED.)



Interior Mechanism.

DESCRIPTION.

THIS Burner possesses the special advantage over other forms in that the gas is turned on gradually and is ignited at the first opening of the valve, the flame gradually increasing to full size. The **fact** that the spark is made simultaneously with the opening of the valve insures safety and absolute protection against leakage.

Fully Warranted.

THOUSANDS IN USE.

THE mechanical details of construction in this Burner have been so perfected that every part is interchangeable.

A careful inspection will show that only the very best materials and skilled labor are used in its construction. It is guaranteed to give absolute satisfaction.

CAT. No.

PRICE.

1075. Automatic Burner

PRICE.

\$5.00

Special Discounts to the Trade in Quantities.



Cat. No. 1075.

FOR SALE IN EVERY

ELECTRICAL SUPPLY HOUSE IN AMERICA.

IN ORDERING GIVE CATALOGUE NUMBERS.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

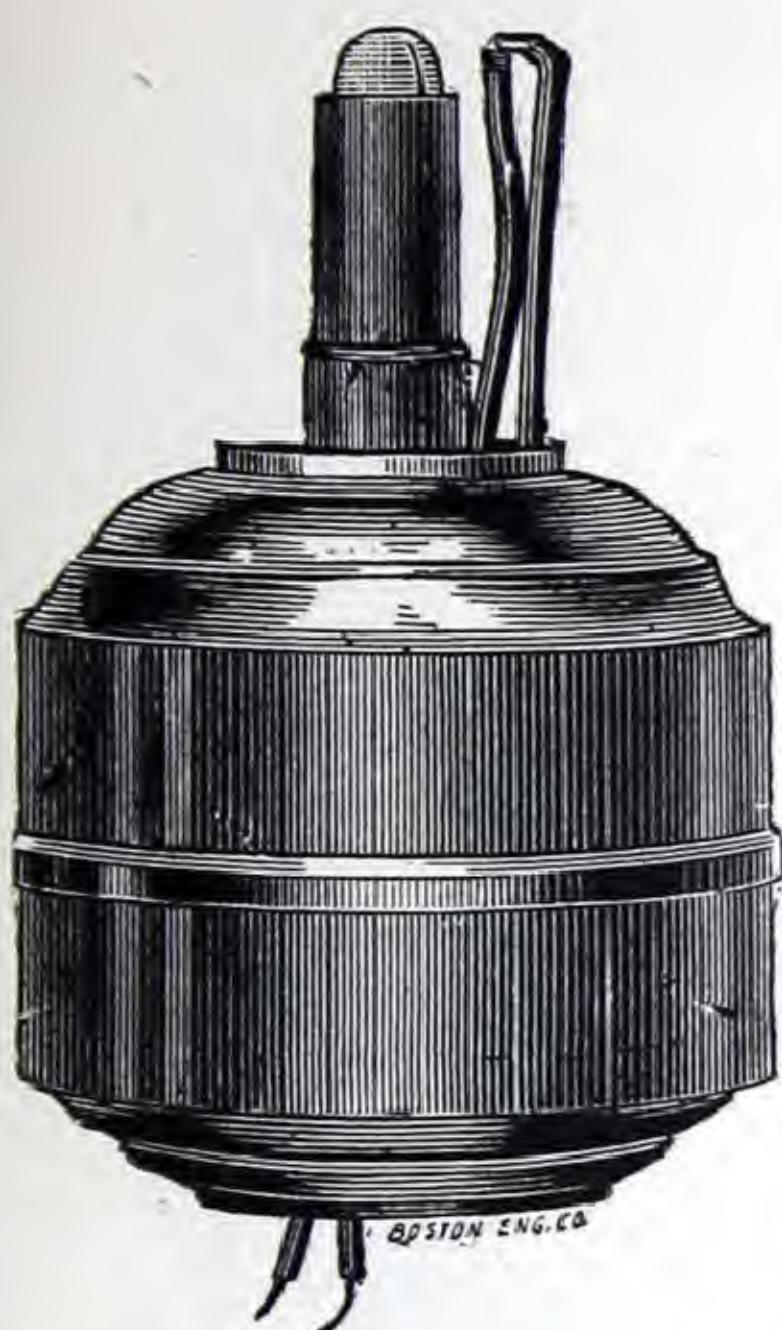
Boston, Mass.

Automatic Burners.

(CONTINUED.)

GASOLINE AUTOMATIC BURNER.

Will give excellent results, and is identical in general construction with the burner described on the previous page.



Cat. No. 1078.

PRICE.

Cat. No. 1078 \$6.75 each.

CANDLE AUTOMATIC BURNER.

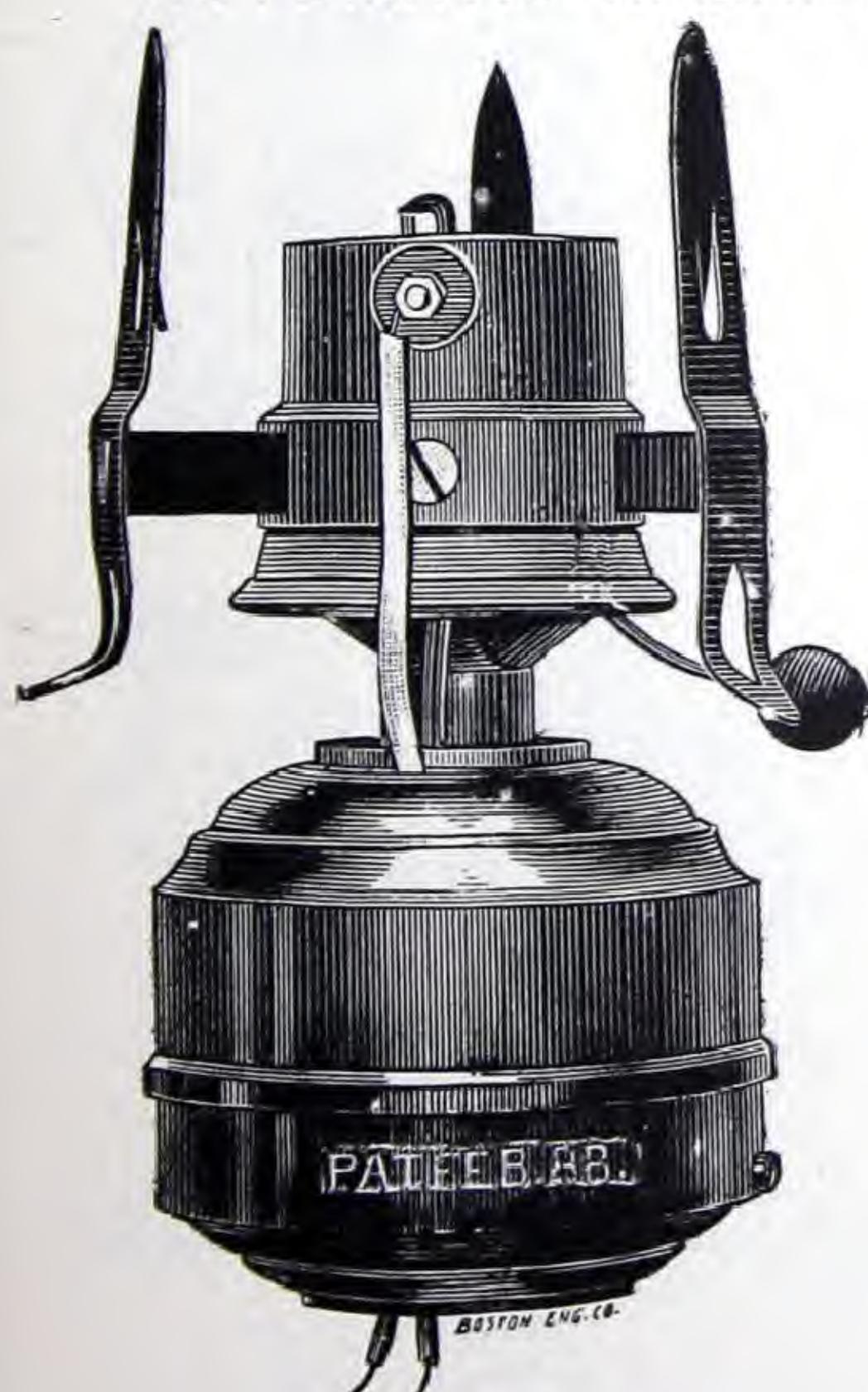
We furnish these Candle Burners complete as illustrated, or can fit our Automatic to special parts at short notice. Immense experience in this special work insures satisfaction.

PRICE.

Cat. No. 1077 \$7.50 each.
Fitting Candles Automatic 6.00 "

Prices for special work furnished on application.

AUTOMATIC ARGAND BURNER.



Cat. No. 1076.
Argand Automatic.

Our regular burner is used in the Argand form. Please so state when wanted for Gasoline.

PRICE.

Cat. No. 1076,
\$7.50 each.



Cat. No. 1077.

Burners Specially Finished at a Slight Advance.

MENTION CATALOGUE NUMBERS WHEN ORDERING.

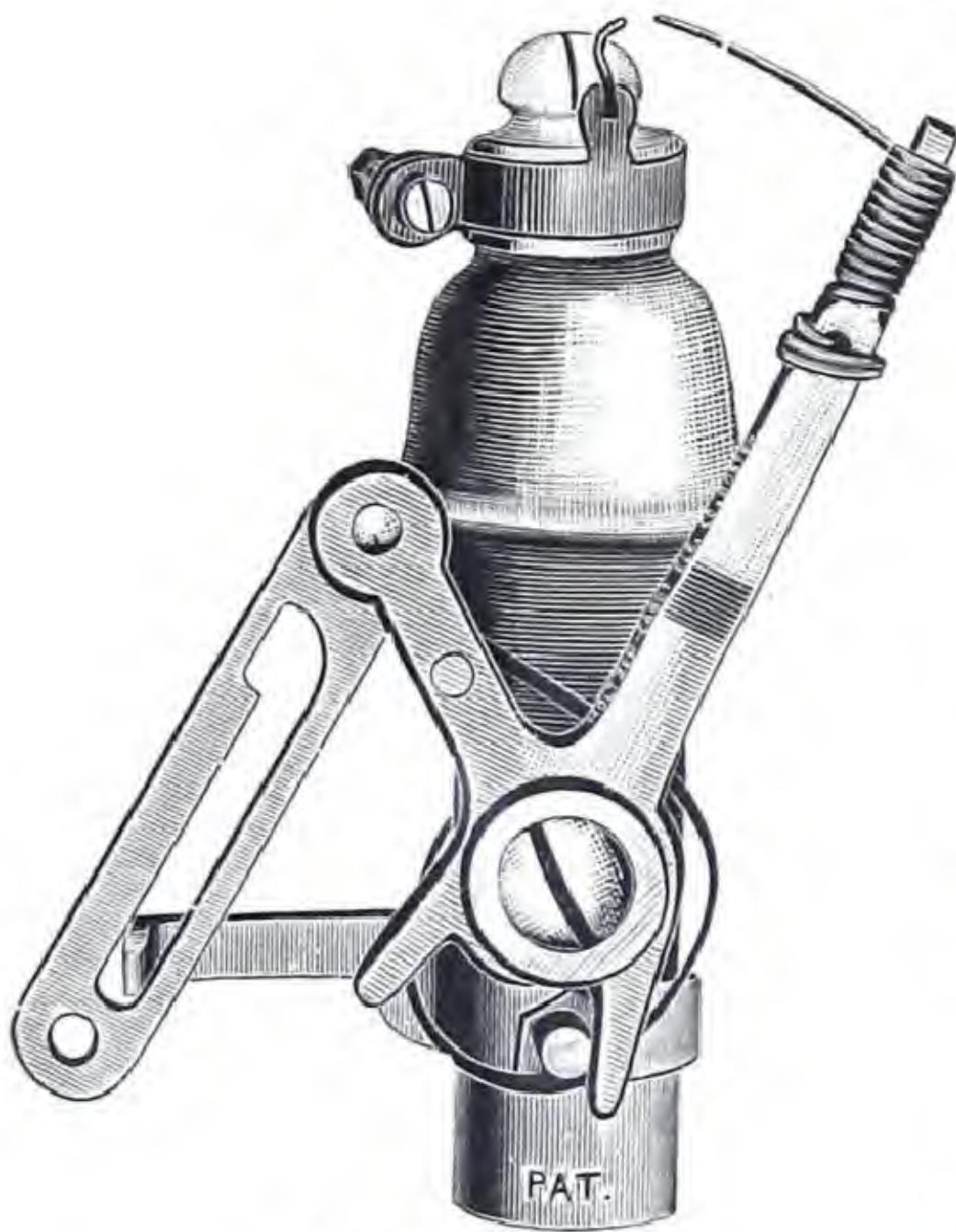
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

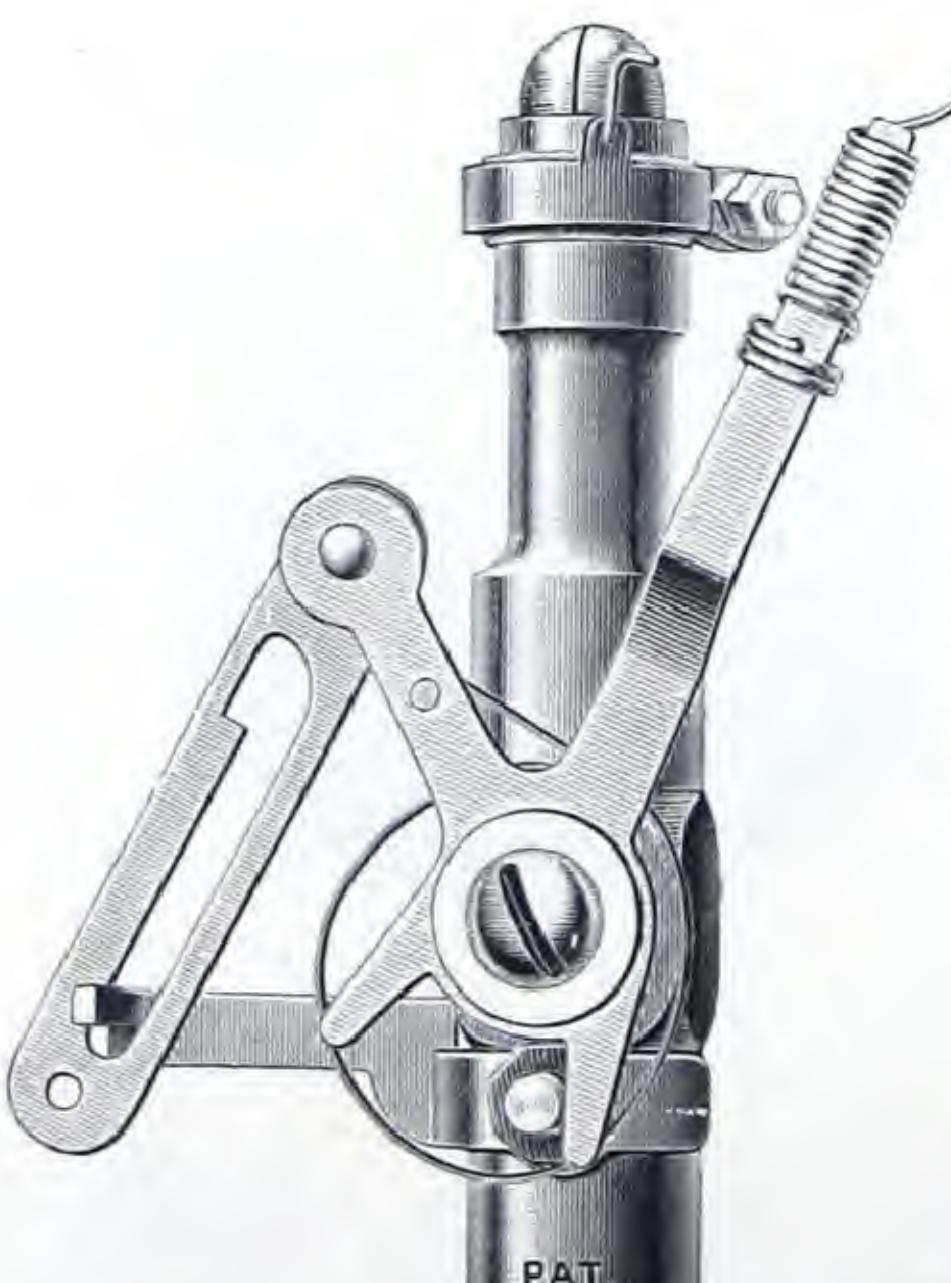
Volunteer Pendant Burners

(PATENTED.)

ABSOLUTELY SAFE.



Volunteer Burner
Cat. No. 1087.
(Position Before Pulling.)



Volunteer Gasoline Burner.
Cat. No. 1100.

DESCRIPTION.

THESE BURNERS are operated as follows: The first pull turns on and ignites the gas, and holds the arm in the slot; the second pull releases the arm, and extinguishes the gas.

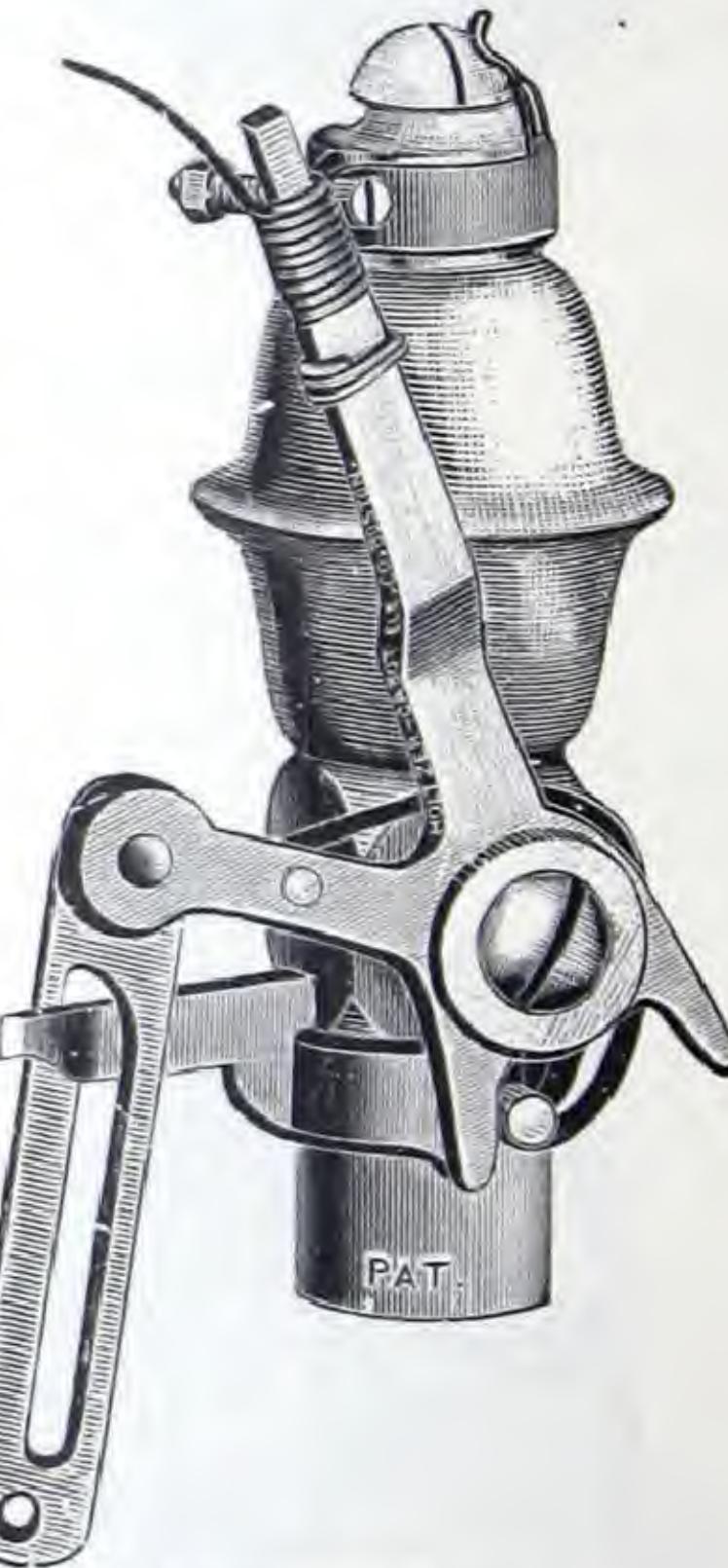
The special advantages of this form of construction are:

1st — The burner arm is connected directly to the gas-way without *any* intervening mechanism.

2d. — The wipe-springs (burner electrodes) can never remain in contact, as the spring will throw the arm to its original position.

3d — Should the burner arm-slot become worn, the valve closes automatically.

4th.— From the position of the arm it can be readily ascertained whether the gas is on or off.



Volunteer Burner.
Cat. No. 1087.
(Position After Pulling.)

PRICE LIST.

CAT. NO.	PRICE
1087 Volunteer Burner, \$1.00 each	
1100 Gasoline Volunteer Burner . . .	1.50 "

Chains not included in price of Burners.

NOTE.— State the kind of gas machine to be used, and if with or without a qualifier, in ordering Gasoline Burners.

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Volunteer Pendant Burners.

(CONTINUED.)



Volunteer Candle Burner.
Cat. No. 1079A.

VOLUNTEER CANDLE BURNER.

NOTE.— Prices here quoted are for Standard Candle Burner.
Specially finished Candles will be charged at a moderate advance.

PRICE.

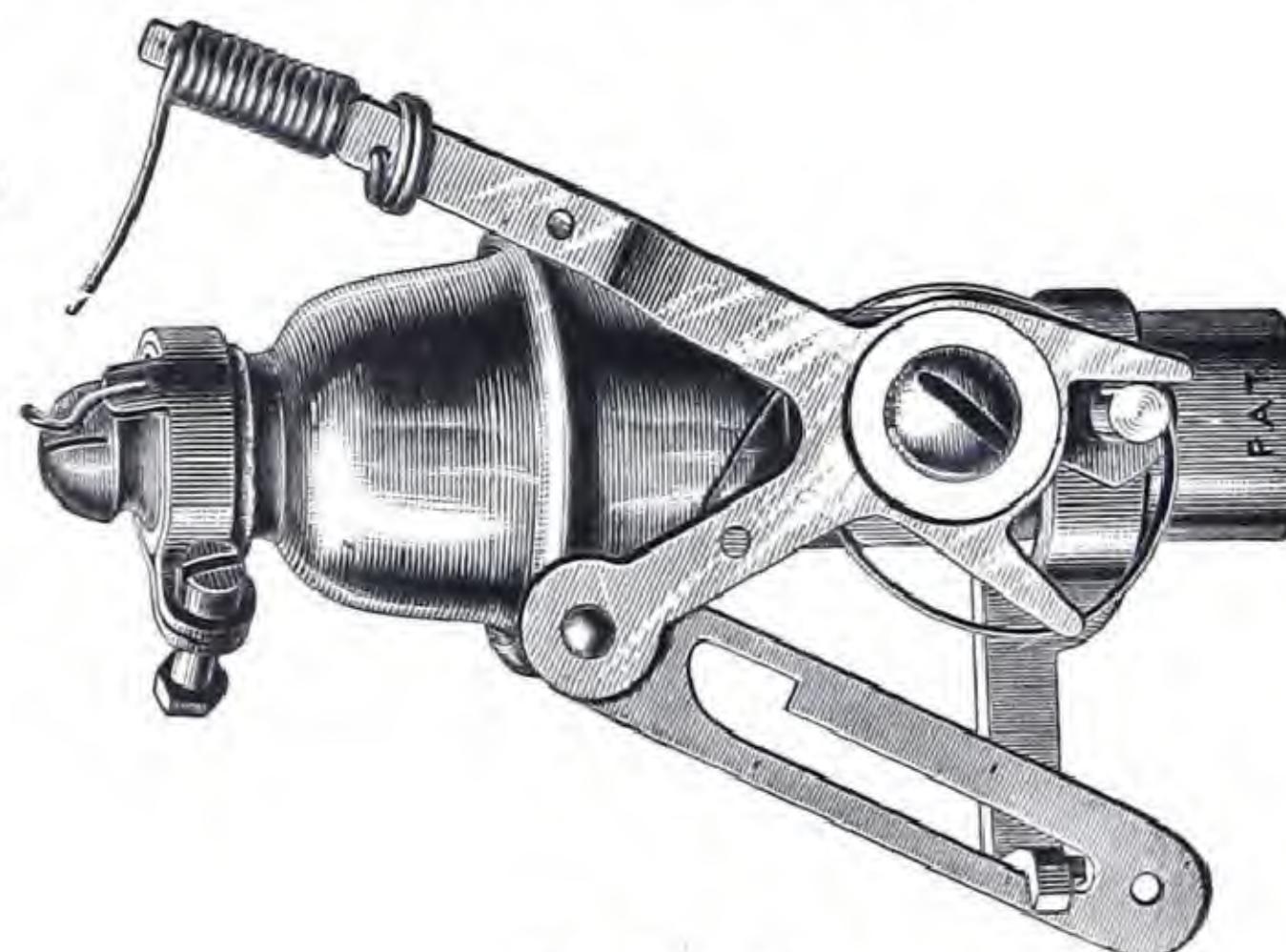
Cat. No. 1079A. Each	\$3.00
Fitting Candles Volunteer, each	2.25

Add 15% for Nickel Plating, 25% for Silver, and 40% for Gold Plating.

VOLUNTEER BILLIARD BURNER.

PRICE.

Cat. No. 1091. Each, \$1.10



Cat. No. 1091.



Volunteer Argand Burner.
Cat. No. 1086.

VOLUNTEER ARGAND BURNER.

PRICE.

Cat. No. 1086. Each	\$2.75
-------------------------------	--------

Above prices do not include Chains.

Pack parts of Candles sent for fitting carefully, and
put your name on box.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Pendant Burners.

(CONTINUED.)

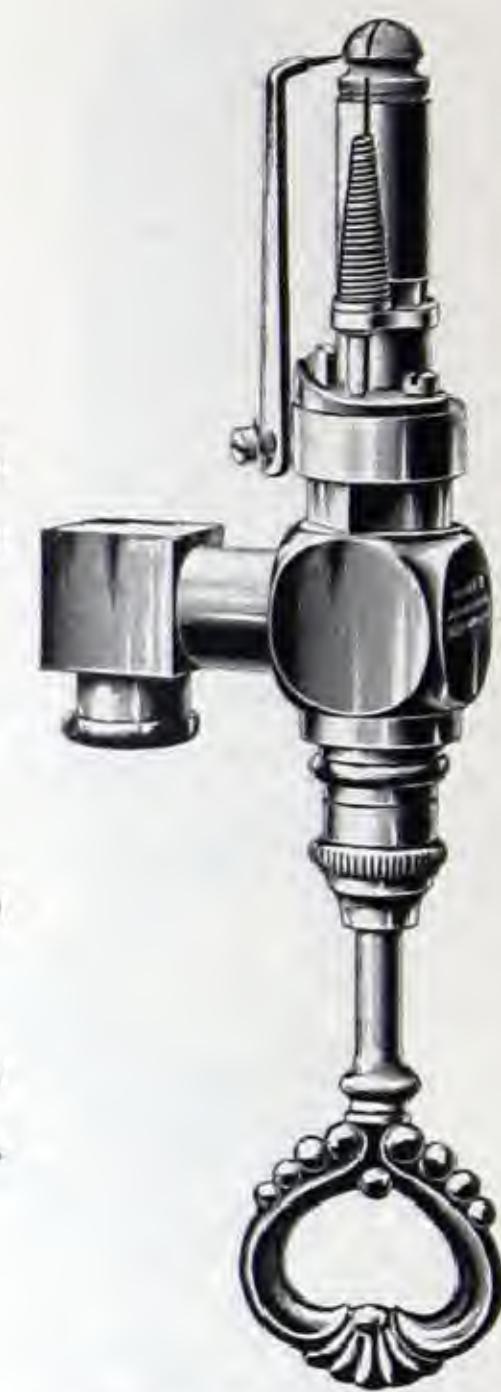


Boston Ratchet Burners, No. 3.
Cat. No. 7000.

RATCHET STYLE.

Standard Pattern.

Boston Ratchets, No. 3,	Each.	\$1.00
Candle Ratchet Burners	"	3.00



New Era Burners.
Cat. No. 7001.

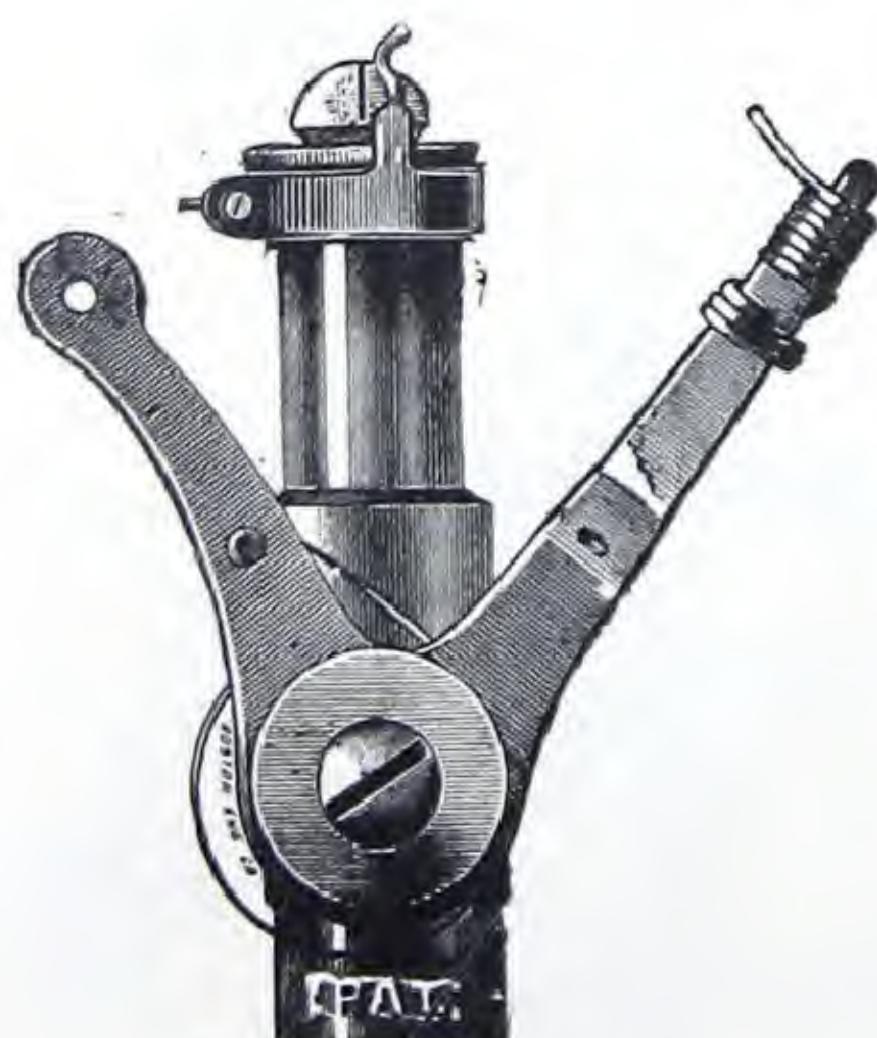
NEW ERA BURNERS.

Cat. No. 7001. Each	.	.	\$2.00
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Stems are made interchangeable and a longer or shorter key can be applied without removing the burner from fixture.

Plain Pendant Burners.

GAS IS TURNED ON BY HAND AT FIXTURE COCK.



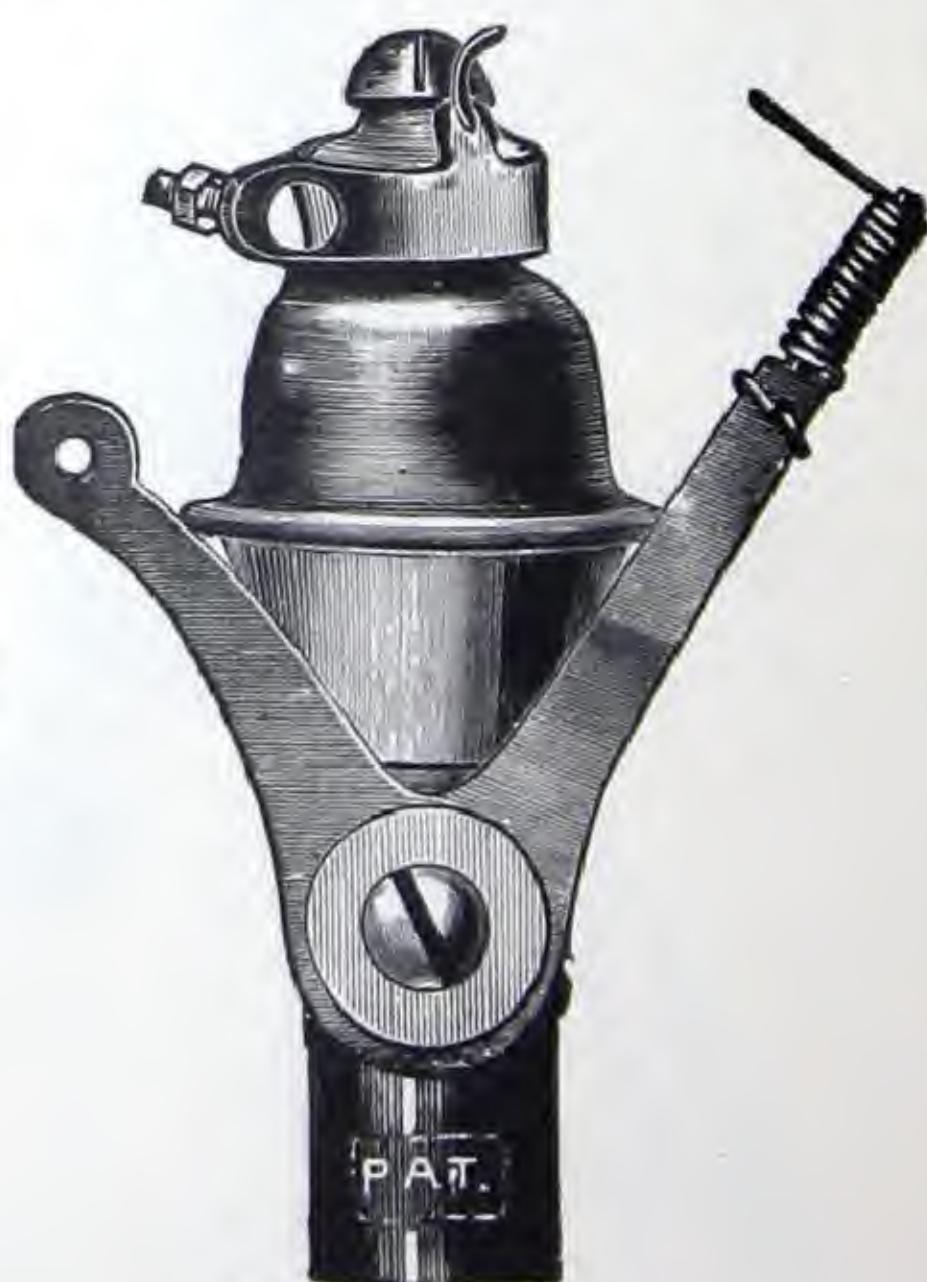
Plain Pillar Burner.
Cat. No. 1085.

Both Cuts Full Size.

PRICE LIST.

CAT. NO.	PRICE,
1085 Plain Pillar Burner	\$0.50
1084 Plain Bulb Burner	.50

Chains Not Included.



Plain Bulb Burner.
Cat. No. 1084.

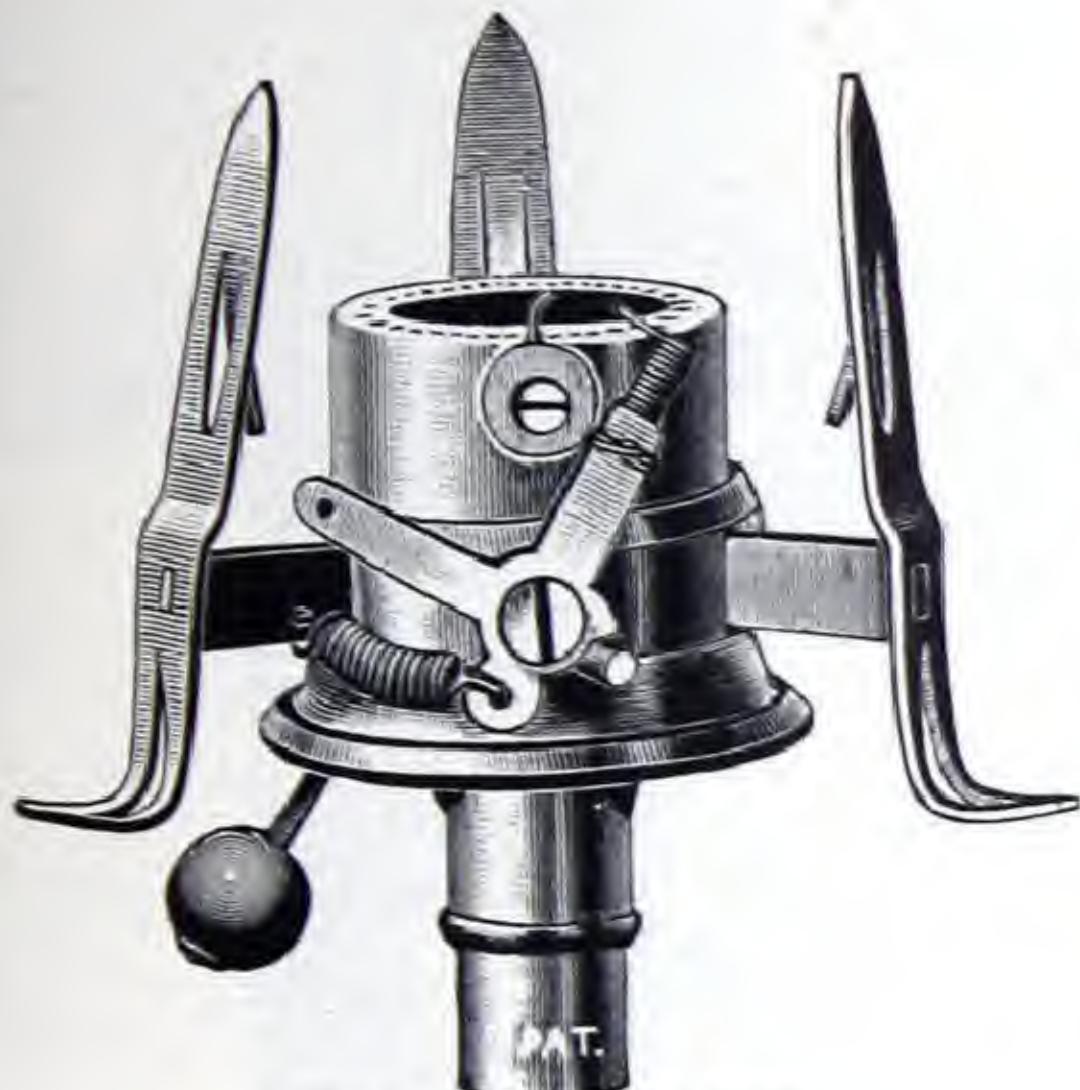
GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Plain Burners.

(CONTINUED.)



Plain Argand Burner.
Cat. No. 1089.

PRICE LIST.

CAT. No.	PRICE.
1089. Plain Argand	\$1.90
1080. Plain Candle	2.25



Plain Candle Burner.
Cat. No. 1080.

CANDLE FITTING.

The price for fitting Plain Candles is ordinarily \$1.80 each. Special prices on difficult lots, or special designs.



Burner Insulator
Bushing.
Cat. No. 1145A.

Gas Lighting Supplies.



Bead Chain.



Cups and Pins.



Acorns.

PRICE LIST.

CAT. No.	PRICE.
1145A. Burner Insulators, each	\$.16
1145. Bead Chain, Gilt, per yard	.24
1146. " " Nickel, " "	.30
1147. " " Silver, " "	.30
1148. " " Gold, " "	.40
1149. " " Gilt, per 100 metres	18.00
(A metre measures 39 inches.)	
1154. Acorns, Brass, per 100	4.50
1154A. " " 1000	30.00
1156. Cups and Pins, Brass, per 100	1.50
1156A. " " " 1000	12.00

Acorns, Cups and Pins in Nickel, Silver and Gold at a moderate advance.



Pendant Chains, Complete.

CAT. No.	PRICE.	PRICE.	
1157. 4-inch, Gilt, each	\$.10	4-inch, Nickel, each	\$.15
1158. 6-inch, " "	.12	6-inch, " "	.18
1159. 8-inch, " "	.15	8-inch, " "	.22
1160. 10-inch, " "	.18	10-inch, " "	.28

GIVE CATALOGUE NUMBERS IN ORDERING.

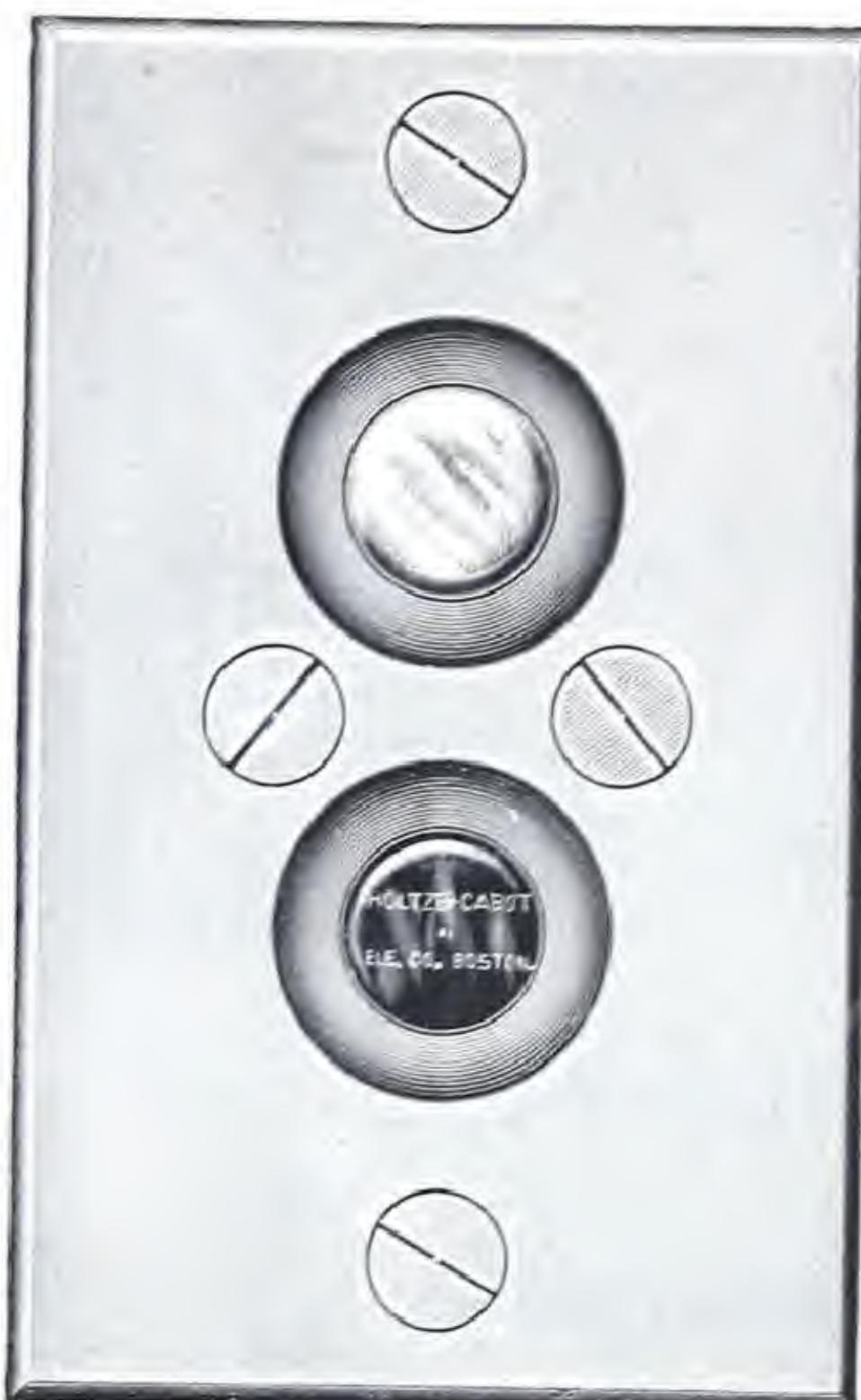
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Gas Lighting Supplies.

(CONTINUED.)

KEYS FOR AUTOMATIC BURNERS.



Polished Nickel Key.
Cat. No. II26. Style B.



Wood Flush Key (Any Wood).
Cat. No. III8. Style A.

Pearl Centres ONLY used on Both Patterns

PRICE LIST.

Both Styles Same Price.

		PRICE.
2	Button Key, for One Automatic	\$.60
4	" " Two "	.90
6	" " Three "	1.20
8	" " Four "	1.65
10	" " Five "	2.00
12	" " Six "	2.35

Finely Finished with Heavy Contacts.

WOOD BASES.

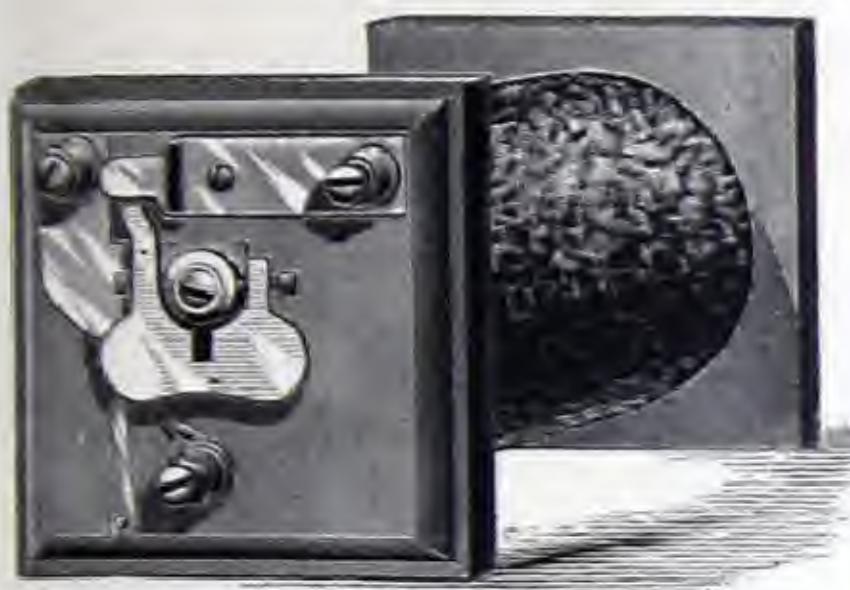
Similar to Style A, for Mounting Nickel Keys, Style B.

		PRICE.
2	Buttons	\$.25
4	"	.35
6	"	.45
8	"	.55

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Spark Coils.



Cat. No. 1166A.
Spark Coils, with Relay Attachment.

MOISTURE PROOF.

PRICE LIST.

STANDARD COILS.

CAT. No.	PRICE.
1166. 8 inches	\$2.50
1167. 10 "	3.00

RELAY SPARK COILS.

CAT. No.	PRICE.
1166A. 8 inch	\$3.50
1167B. 10 "	4.25

NOTE.—The Relay in case of a short circuit rings a bell giving warning of the trouble.



Cat. No. 1166.
Standard Spark Coil (Heavy).

Burner Wrenches, Etc.

COMBINATION
SCREW DRIVER AND NUT
WRENCH.

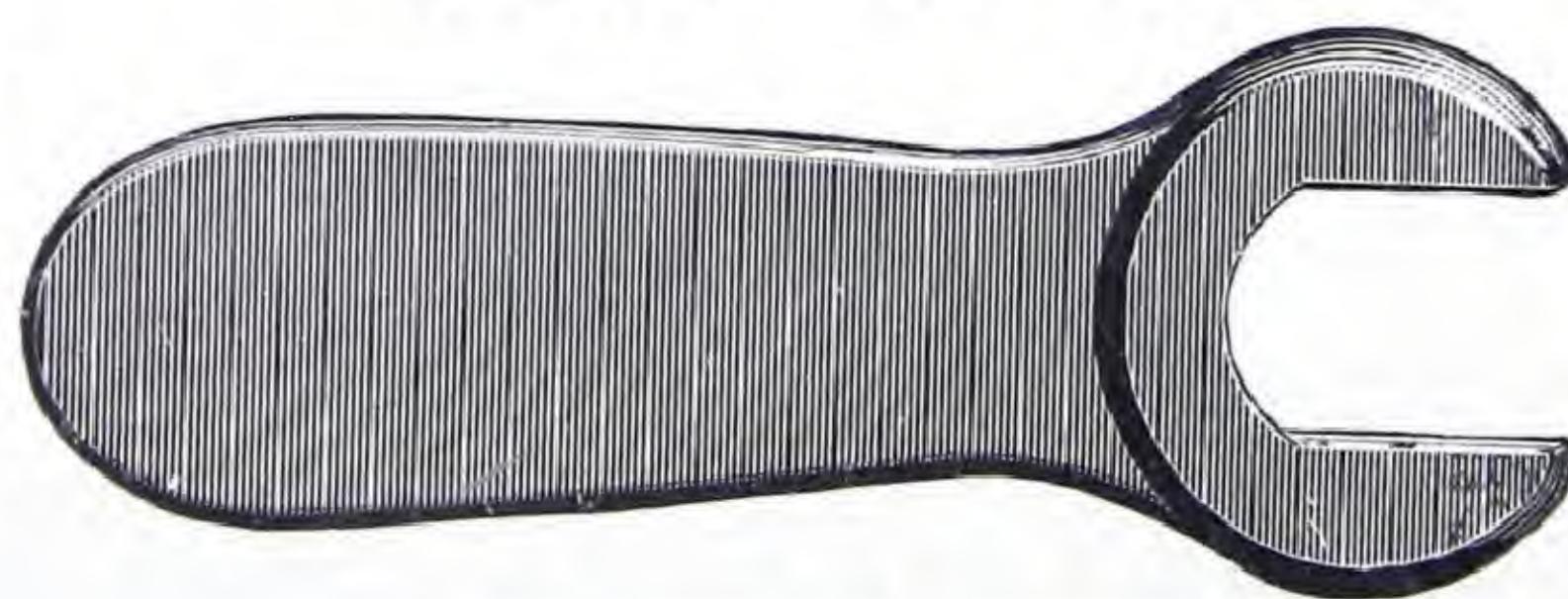


Made of Stubbs Steel. Nickel Plated.

PRICE.
Cat. No. 1180A. \$.40

Very handy in adjusting burners and in
making connections.

BURNER WRENCH.



For use with H. C. Burners.

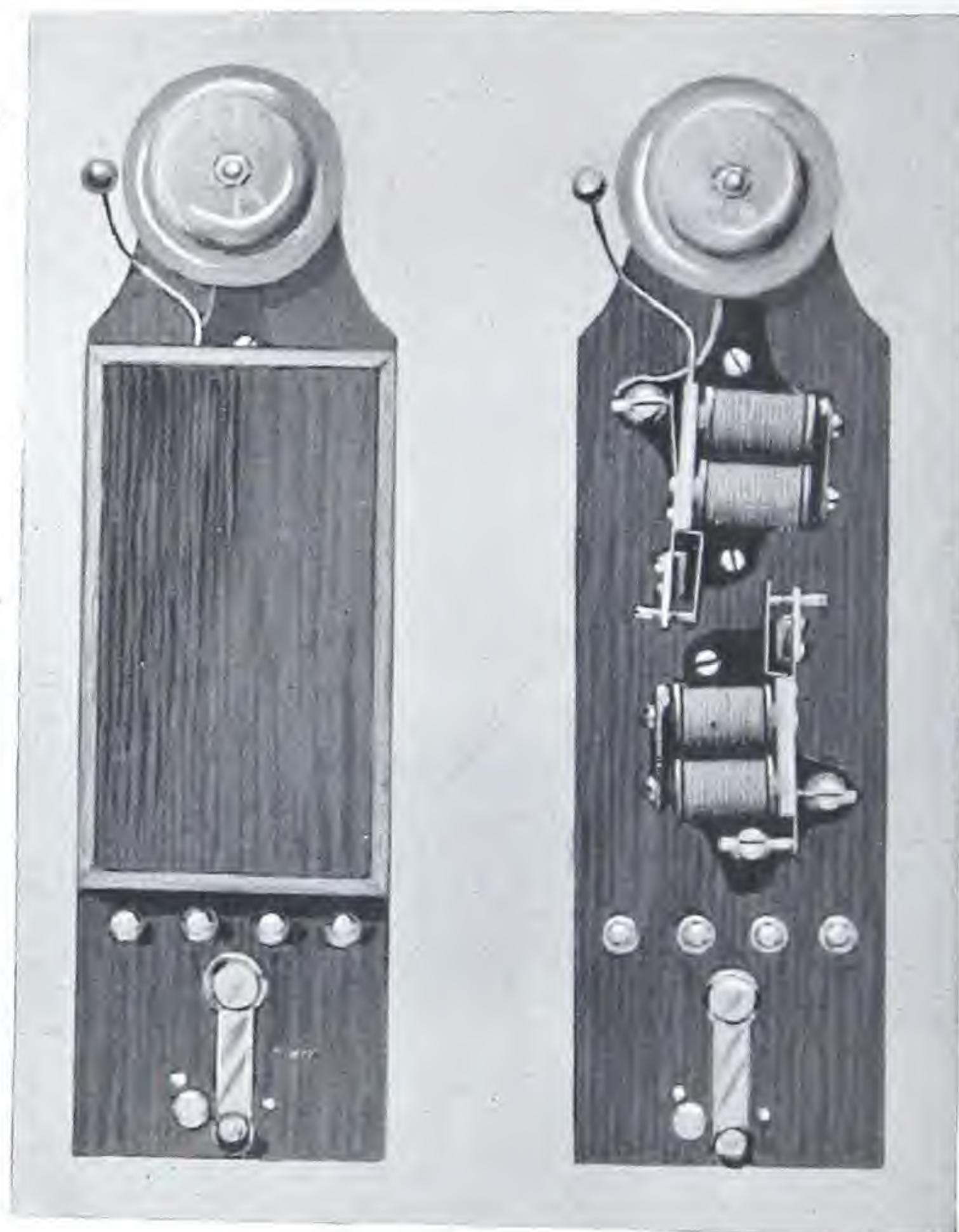
PRICE.
Cat. No. 1172. \$.20

Useful in attaching pendants to fixtures.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Combination Relay and Bell.



Dimensions, 3 5-8 x 12 1-4 inches.

Description.

THIS Relay is specially designed for gas lighting circuits. The idea is to have the relay connected with the spark coil so that if any short circuit should occur the bell will indicate it. Of course, this apparatus can also be used for various other purposes where relays and alarms are required. The switch at the bottom is intended to open the circuit in order to prevent the batteries from running down until the trouble is obviated. This makes a very compact and inexpensive apparatus to protect gas lighting circuits.

PRICE.

Cat. No. 444A, as per cut

\$3.50

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Gas Fixture Wire.

COLORS: YELLOW, WHITE, BRONZE AND BRASS.

Well Paraffined—Triple Wound—1-2 lb. Spools.

No. 22	\$1.35	No. 24	\$1.65	No. 26	\$1.90
------------------	--------	------------------	--------	------------------	--------

Of Better Insulation—Quadruple Wound—4 Winds Silk.

Carried in Size No. 24 only	\$3.50 per lb.
---------------------------------------	----------------



Batteries for Gas Lighting.

We recommend our well-known Cylinder or Monarch Battery for operating Automatic or Pendant Burners, or Ruhmkorff Coils for Multiple Lighting.

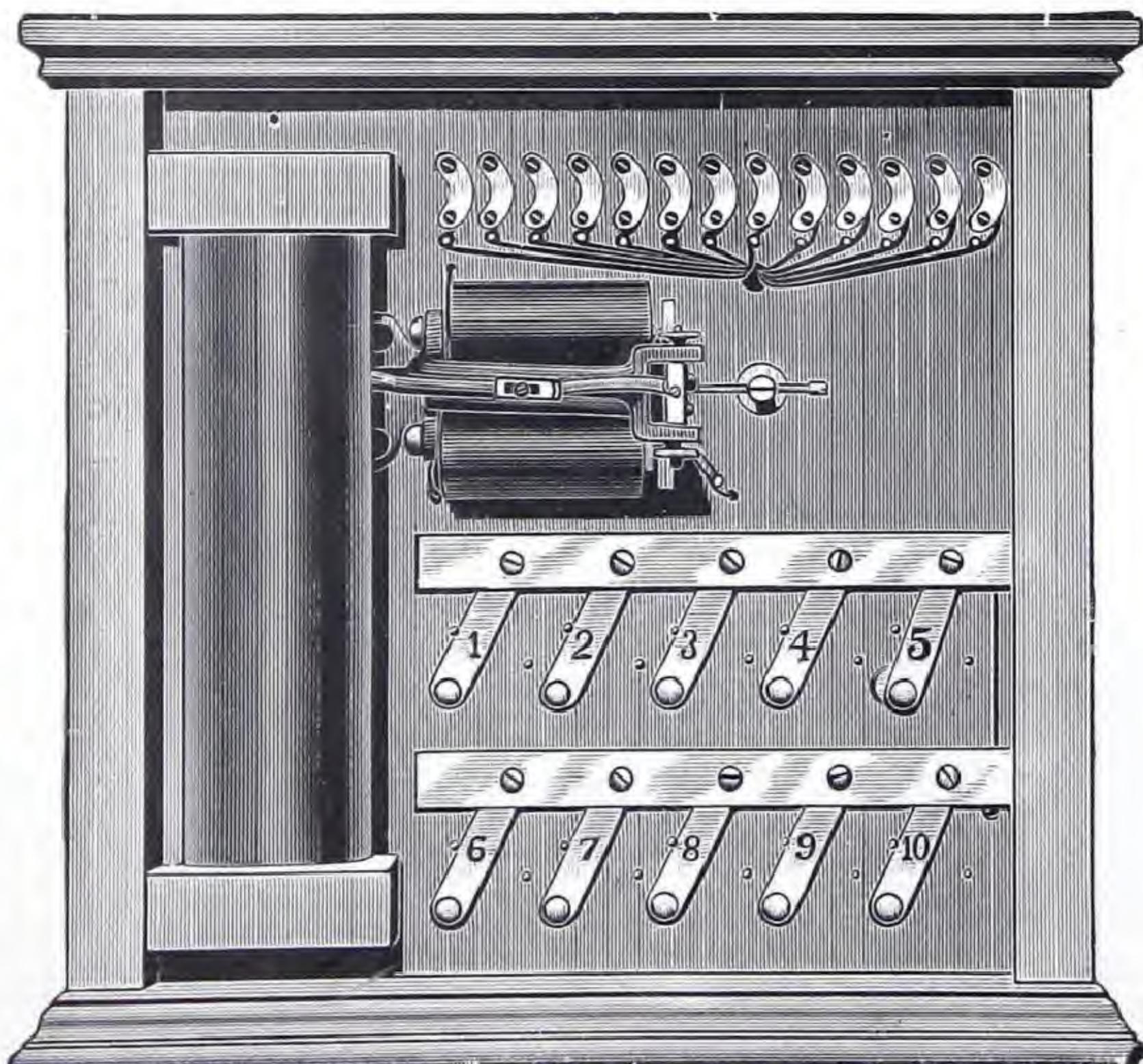
SEE PAGES 54 TO 57.

Sectional Switch Cut-Out.

For Lighting Gas Circuits.

This instrument consists of a Spark Coil, Relay and Switches arranged in a neat wood case. Each separate circuit is wired to its respective Switch Arm. In case a short circuit takes place from any cause whatever, the relay is closed and a bell, which may be conveniently located, is rung.

The switch which stops this Alarm Bell, when turned off, indicates the circuit in which the trouble is located. The other switches may be replaced and the other light used until the trouble is remedied.



Cat. No. 1180.

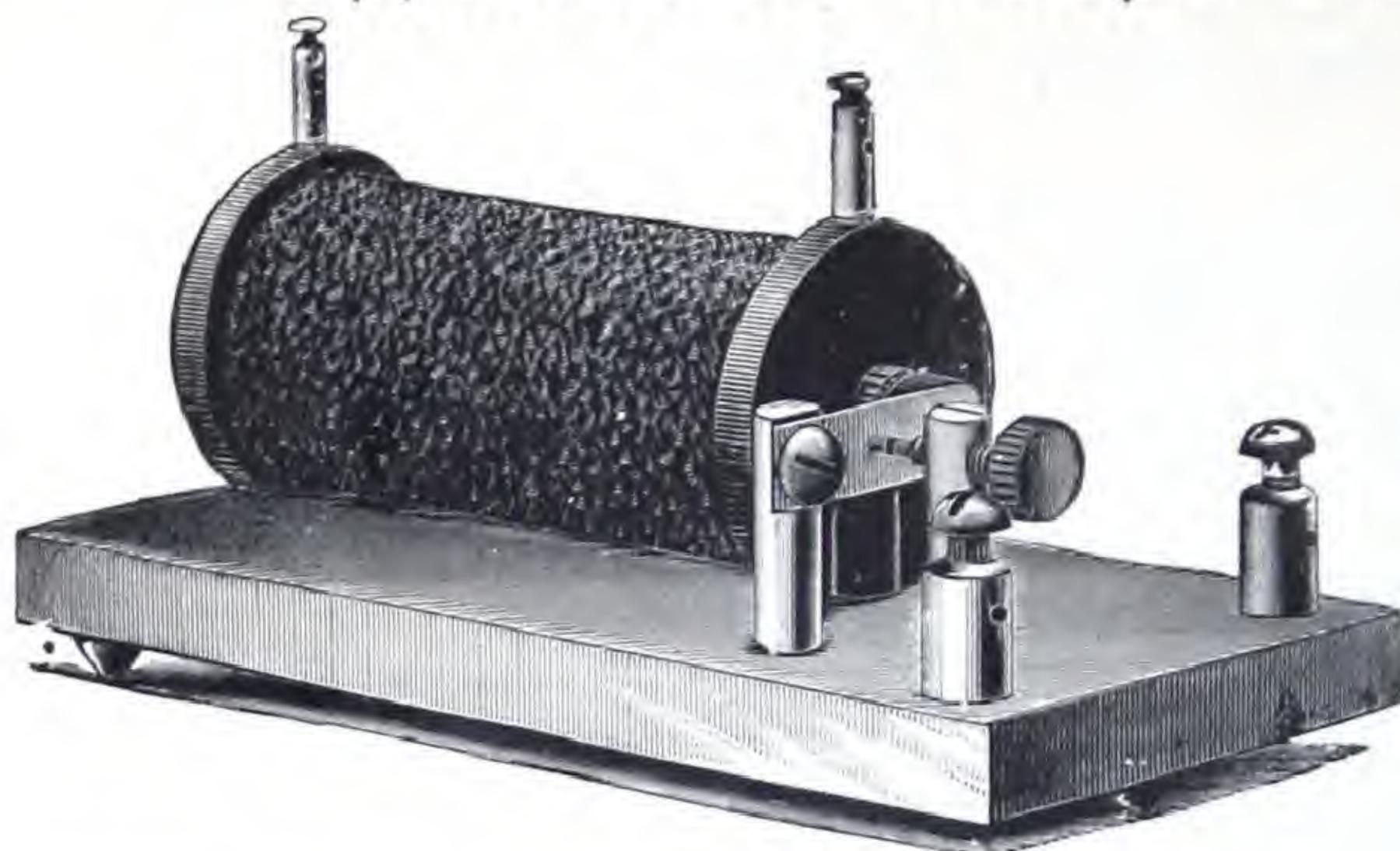
PRICE.

Sectional Cut-Out, any wood, complete with 10 sections (switches)	\$15.00
Each additional Switch above 10 . . . . .	.20

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Apparatus for Multiple Gas Lighting.



INDUCTION COILS.

PRICE LIST.

CAT. NO.	PRICE.
1771. Spark, $\frac{1}{2}$ inch	\$14.00
1772. " $\frac{5}{8}$ "	20.00
1773. " $1\frac{1}{4}$ inches	40.00
1774. " $1\frac{1}{2}$ "	42.00
1775. " 2 "	60.00

Prices of larger sizes on Application.

FRictional LIGHTING MACHINE.

CAT. NO.	PRICE.
1105. 8 inches size, 35 lights	\$48.00
1106. 12 inches size, 65 lights	78.00

Switches for Multiple Lighting.

MAHOGANY.

CAT. NO.	PRICE
1107. Two Points	\$2.75
Three "	3.25
Four "	4.00
Five "	4.75
Six "	5.75



Multiple Burner.

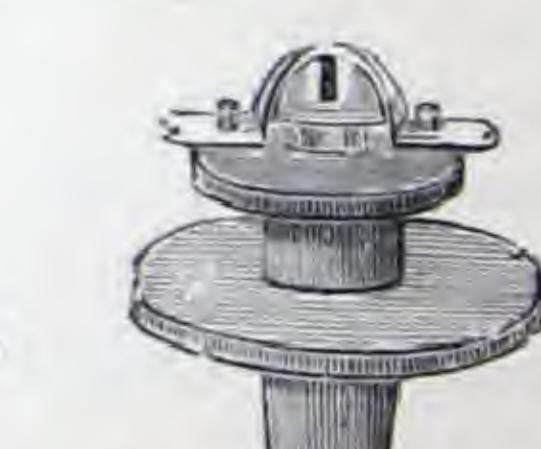
TIPS FOR MULTIPLE LIGHTING.

PRICE LIST.

Smith's Tips, of Lava, with Guard Flange of Isinglass,	
Cat. No. 1112, per dozen	\$6.50

MULTIPLE TIPS.— Ordinary Pattern.

Cat. No. 1180.	Cat. No. 1108. Per dozen	\$5.00
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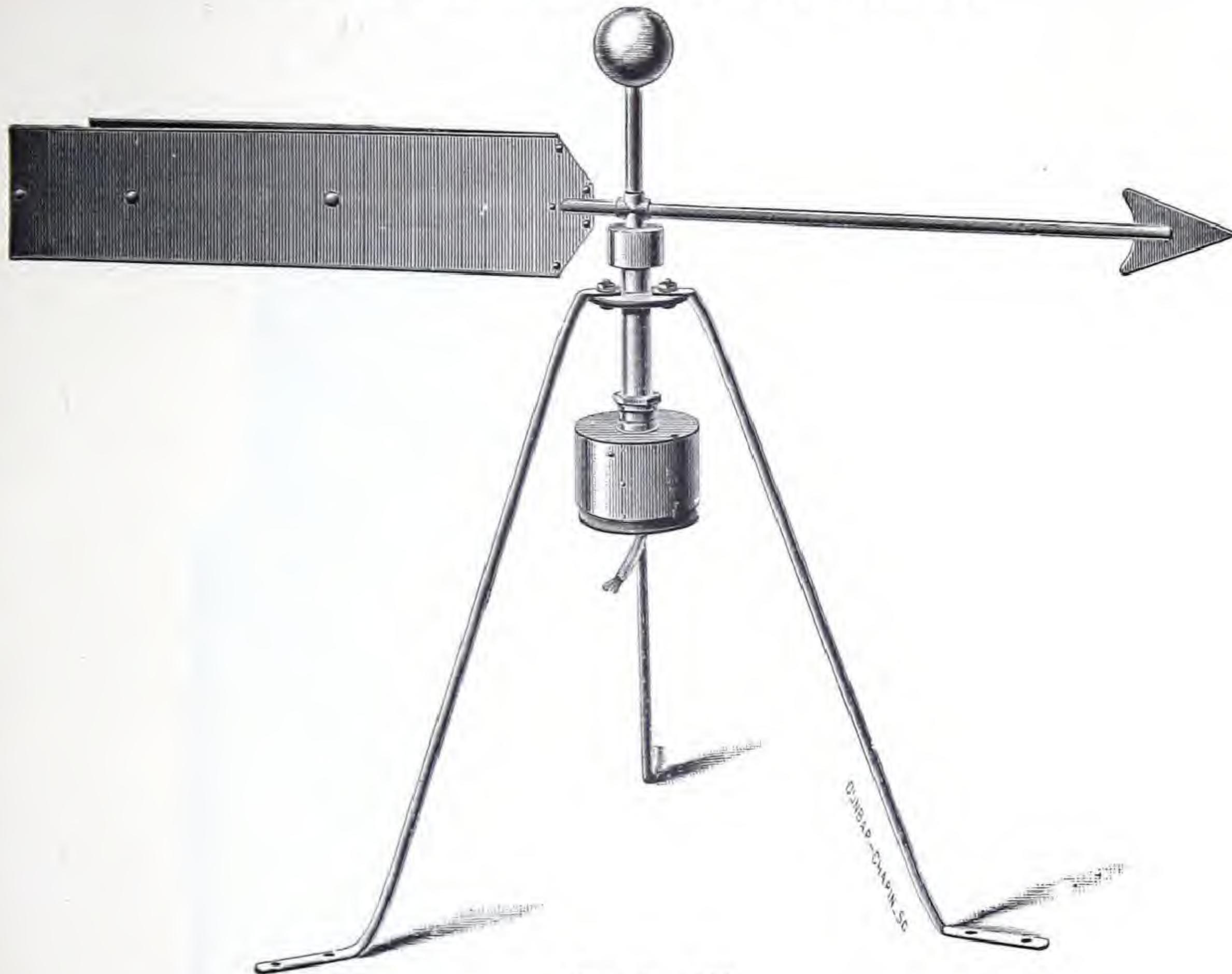


PAT'D JAN 22 '84
Smith's Multiple Gas Tip.
Cat. No. 1112.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electric Wind Indicator. VANE AND CONNECTION BOX, ON TRIPOD.



Cat. No. 1522.

Description.

The vane is connected electrically (through the box at base) with the dial shown in the adjoining cut. If it is desired to ascertain the direction of the wind, the circuit is closed by a push button or switch, when the dial hand will at once assume its correct position. Open circuit batteries are recommended for its operation.

PRICE.

Vane and Dial \$70.00

Further information on application.

NOTE.—Can be operated from incandescent lighting system to continually show direction of wind.

Estimates furnished.

ORDER BY CATALOGUE NUMBERS.



Dial, indicating Direction of Wind. Cat. No. 1520.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Holtzer Carbon Batteries.

(PATENTED)



Cut showing General External Appearance
of Monarch and Cylinder Patterns.

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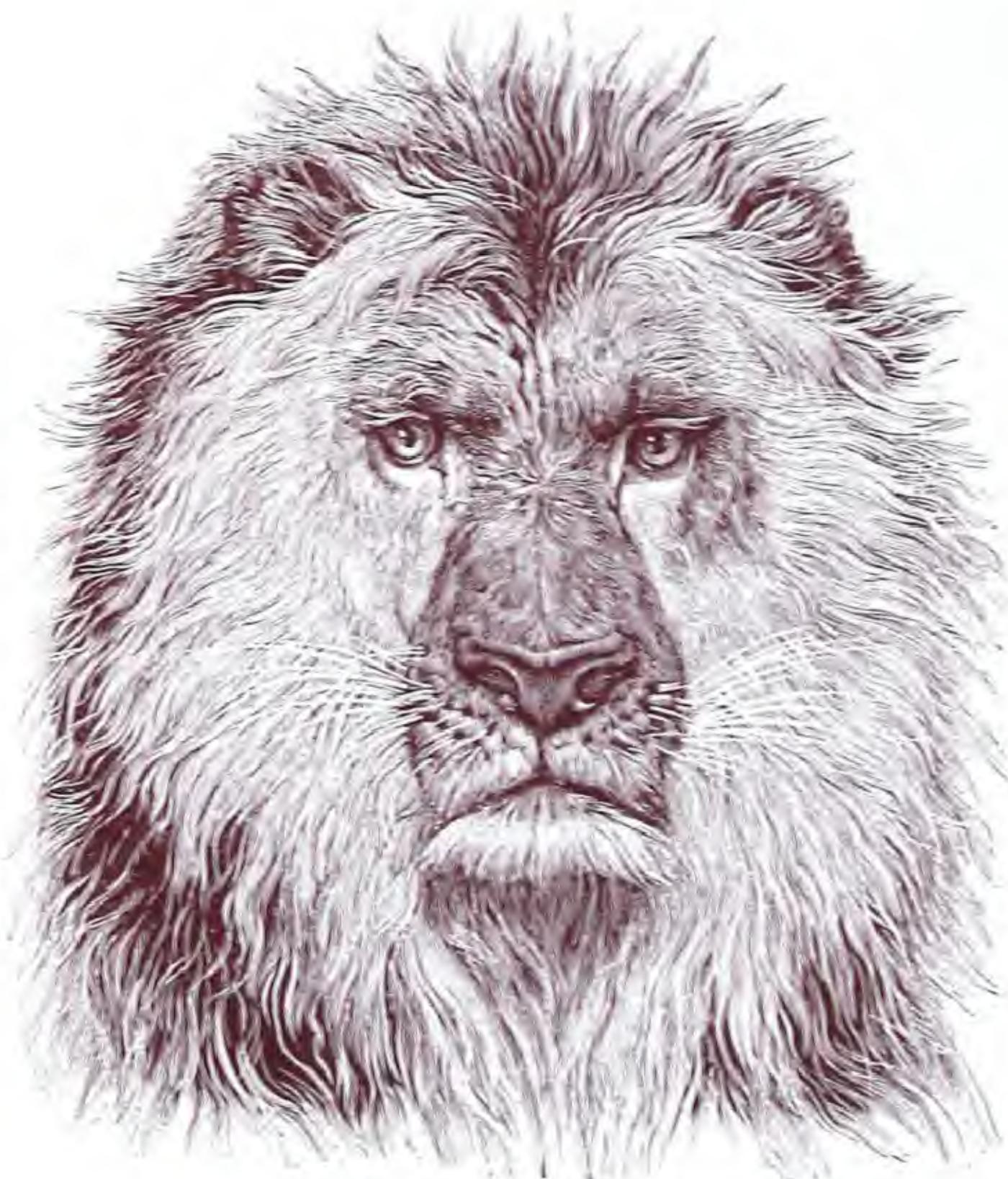


CCA

Holtzer

Cylinder and Monarch Batteries.

(PATENTED.)



REGISTERED TRADE MARK.

Unequalled for All Open-Circuit Work.

Lat. No.
786. C.
C.
P.
C.
G.
S.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Holtzer Carbon Batteries.

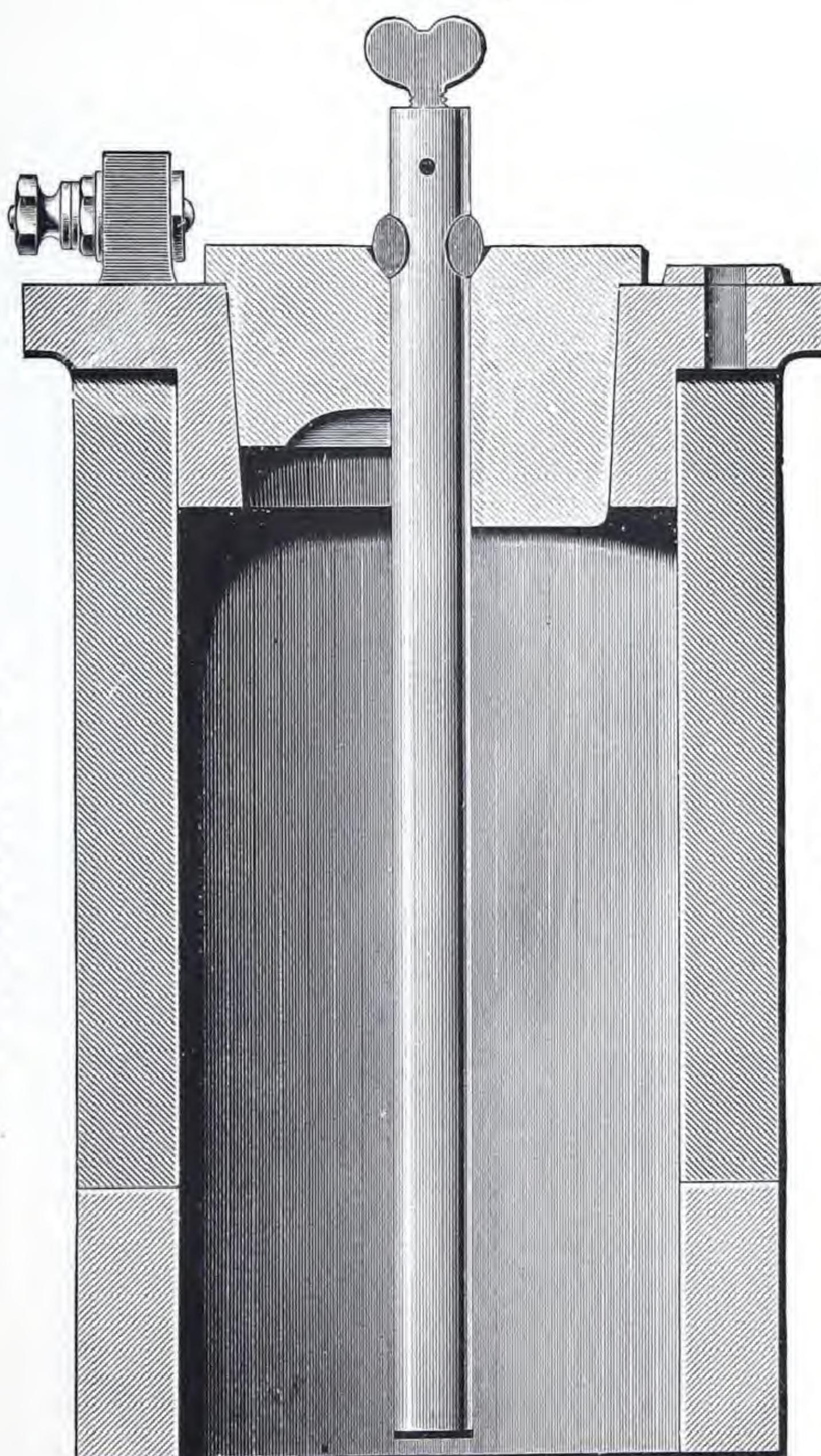
CYLINDER TYPE.

CUT SHOWING CROSS SECTION.

(PATENTED.)

CYLINDER

BATTERY.



Cat. No. 785.

PRICE LIST.

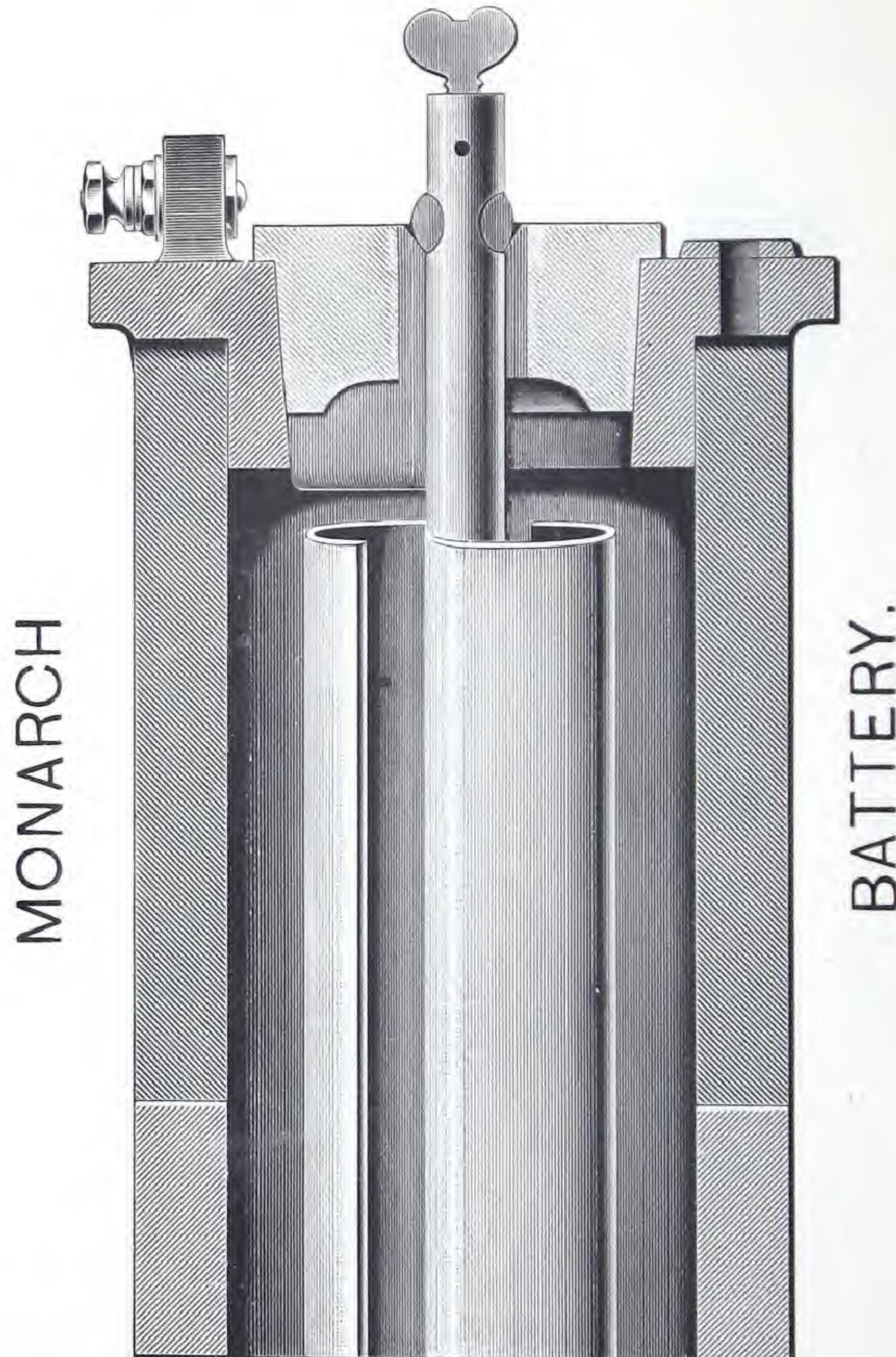
CAT. No.	PRICE.
785. Cylinder Battery, complete	\$1.12
Carbon Cylinders, each	.75
Porcelain Insulators, each	.04
Cylinder Zines,	.10
Glass Jars,	.25
Sal Ammoniac, per package	10

THE HOLTZER-CABOT ELECTRIC COMPANY. . . .

Boston, Mass.

The Holtzer Carbon Batteries. MONARCH TYPE.

CUT SHOWING CROSS SECTION.
(PATENTED)



Cat. No. 785A.

For cut of complete cell, see page 54.

PRICE.

SPECIAL NOTICE.—The term "Monarch" is applied to our carbon cell with the large zinc as above. Where the cylinder rod zinc is used it is termed "Cylinder Battery."

Sal Ammoniac in bulk, at lowest market prices.

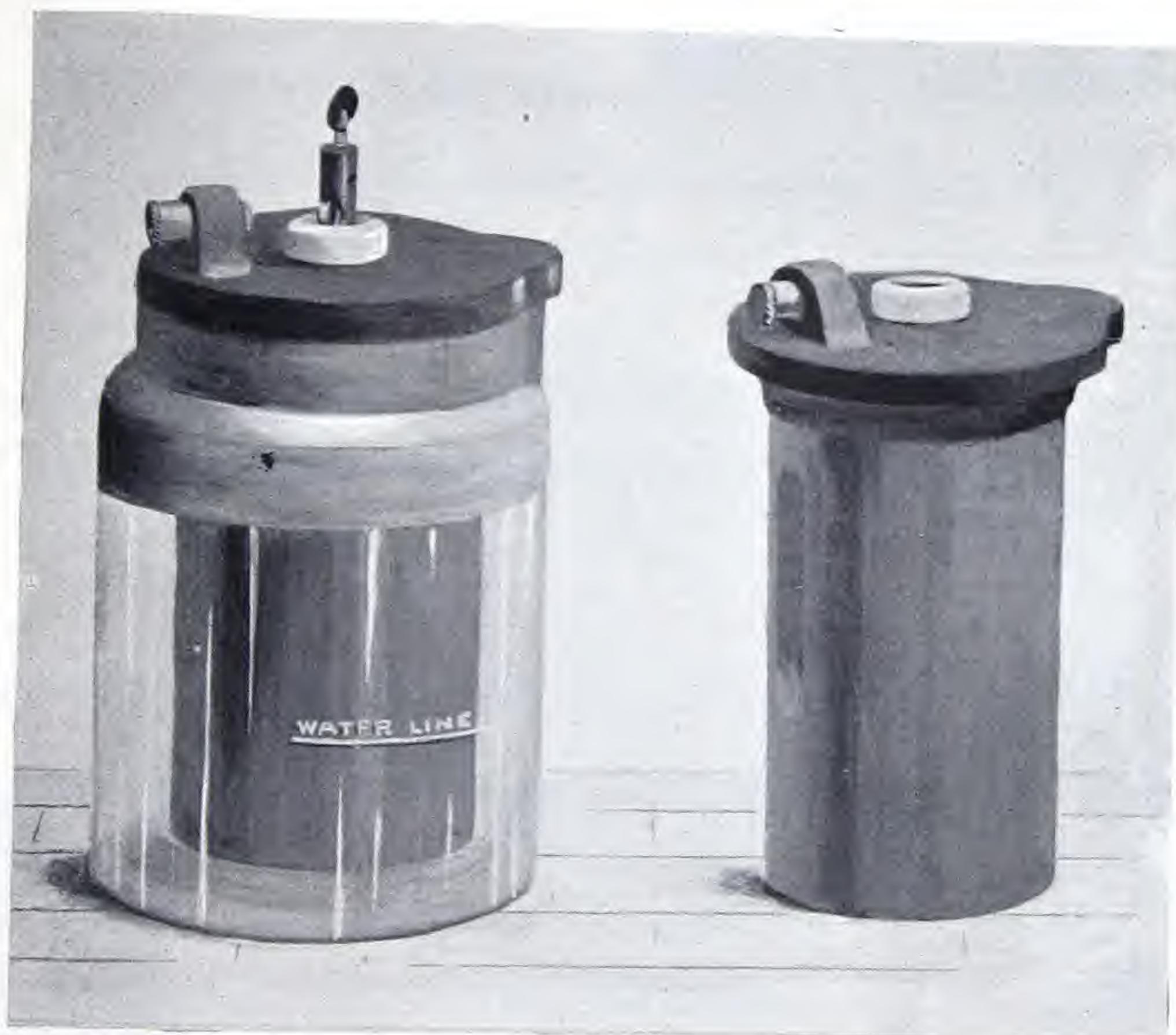
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Holtzer Cylinder Battery.

DOMESTIC PATTERN.

(PATENTED.)



Cat. No. 785H

PRICE LIST.

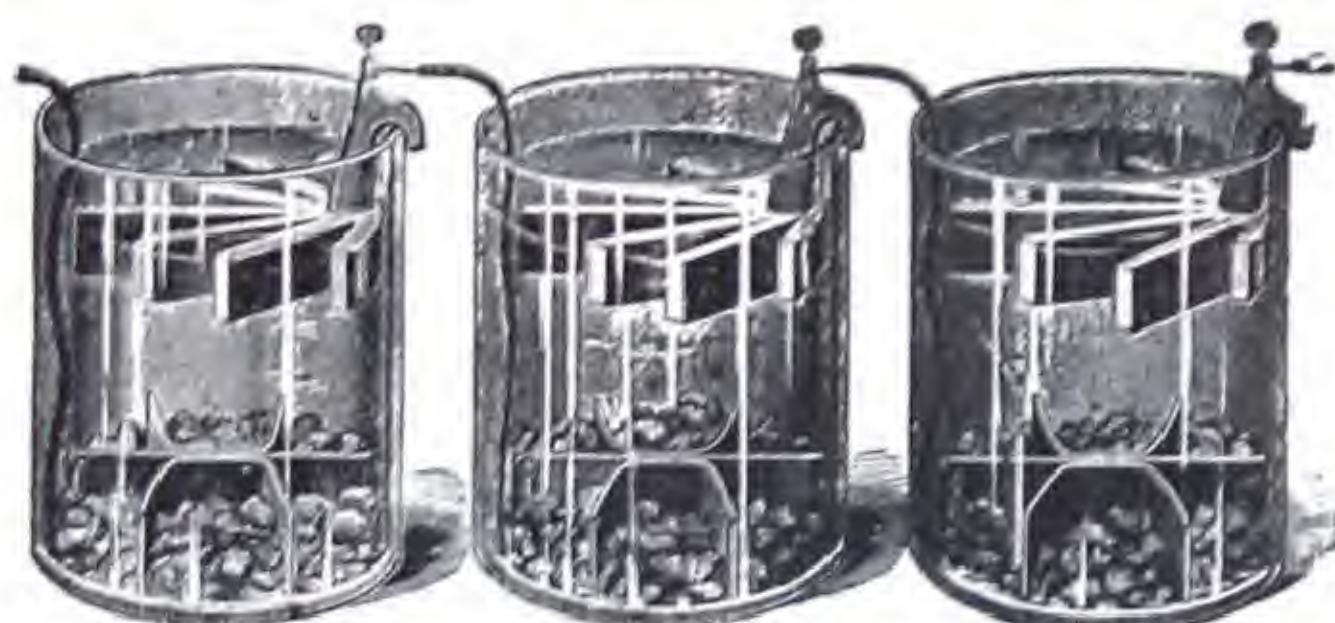
	PRICE,
Domestic Cylinder Battery, complete	\$.90
" " carbons only	.50
" " jars "	.25
" " zincs	.10
1 Ammoniac, per package	.10

NOT MADE IN MONARCH PATTERN.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Batteries and Battery Material.



Used in closed circuit work, as on Telegraph Lines, etc.

GRAVITY BATTERIES.

Crowfoot Pattern.

CAT. NO	LARGE SIZE.	
928.	6 x 8 size, complete	\$1.00
929.	Zincs only	.40
930.	Coppers only	.24
931.	Jars "	.32

SMALL SIZE.

933.	5 x 7 size, complete	.80
934.	Zincs	.33
935.	Coppers	.15
936.	Jars	.27

Blue Vitrol at lowest market rates.

DRY BATTERIES.

Under some conditions a fluid battery is not desirable, as on shipboard, or, wherever spilling of the solution is liable to occur; here Dry Batteries are very useful.

PRICE.

Cat. No. 865. "Mesco."	Each	\$1.00
Cat. No. 865C "Bunnell."	Each	1.00



Cat. No. 865.

DISQUE LECLANCHE BATTERIES.

Our Standard Pattern. Well Made.

Those who prefer this long tried form of Open Circuit Cell may be certain of good results in purchasing of us. The Porous Cup, etc., are made of the best materials.

PRICE.

Cat. No. 795, complete	\$0.90
Zincs	.10
Porous Cups	.60
Sal. Ammoniac, per pkg.	.10
Jars	.20



Cat. No. 795

GIVE CATALOGUE NUMBERS IN
ORDERING.



Cat. No. 865C.

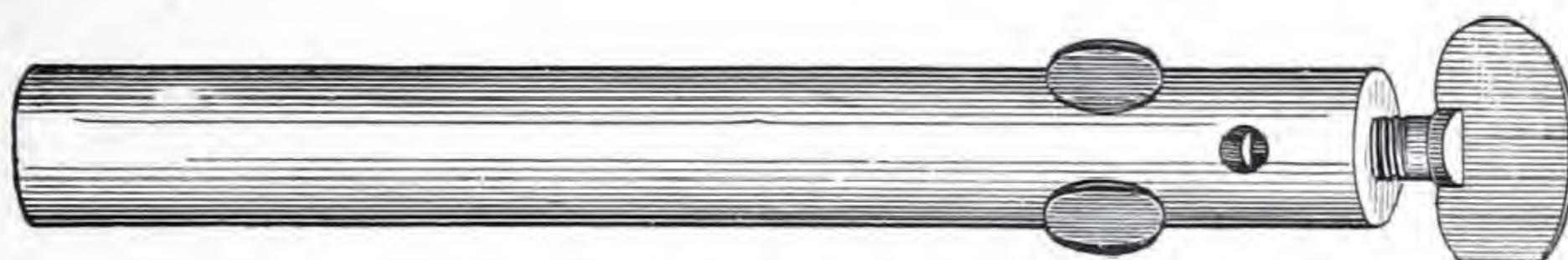
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Battery ZinCs.

OUR OWN.

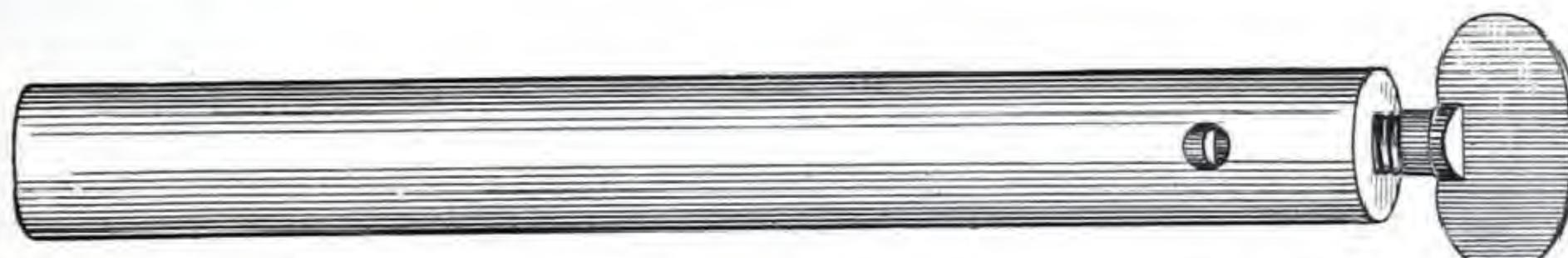
ALL ARE OF THE BEST QUALITY ROLLED ZINC. THE BEST
KNOWN FOR BATTERY PURPOSES.



Cat. No. 1000.

For Our Cylinder Battery.

6 $\frac{3}{4}$ inches long.



Cat. No. 1002.

For Leclanche Battery.

6 $\frac{3}{4}$ inches long.



Cat. No. 1006.

Leclanche String Zinc.



MONARCH ZINC.

PRICE LIST.

Above ZinCs (3 styles same price)	•	\$.10 each.
" " " "	•	6.75 per c.
Monarch ZinCs (Large)	• . . . .	.30 each.
" " " "	•	25.00 per c.

SAL AMMONIAC IN BULK AT LOWEST MARKET RATES.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Push Buttons.

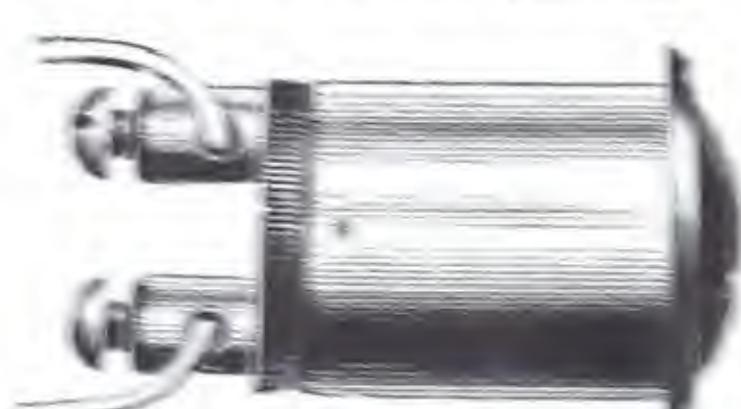
WOOD AND METAL.

DESK PUSHES.

Black or White Centers.



Cat. No. 560C
Price each \$.54



Cat. No. 565
Price \$.30

WOOD PUSH — Standard Pattern.

WIDGET PUSH.



Full Size.
Cat. No. 568.
Hard Rubber \$.50
Oak, Ash, Walnut or
Mahogany 25

MULTIPLE FLUSH
WOOD PUSH.



Cat. No. 570E.



Walnut, Ash, Oak or Cherry \$.20
Rosewood or Mahogany 25

MULTIPLE FLUSH
METAL PUSH.



Cat. No. 570D.

MULTIPLE FLUSH PUSHES.

PRICE LIST.

Each Style same price. 3 buttons \$.80
Add 10cts. for each additional button desired.

FINELY POLISHED WOOD PUSHES.

EXTRA FINISH



Half Actual Size.
Cat. No. 570A.

WOODS. — These three Styles furnished in Oak, Maple, Walnut, Cherry and Imitation Ebony and Rosewood.

Cat. No. 570A, per 100, \$12.00

PRICE LIST.
Cat. No. 570B, per 100, \$25.00

PRICE LIST.



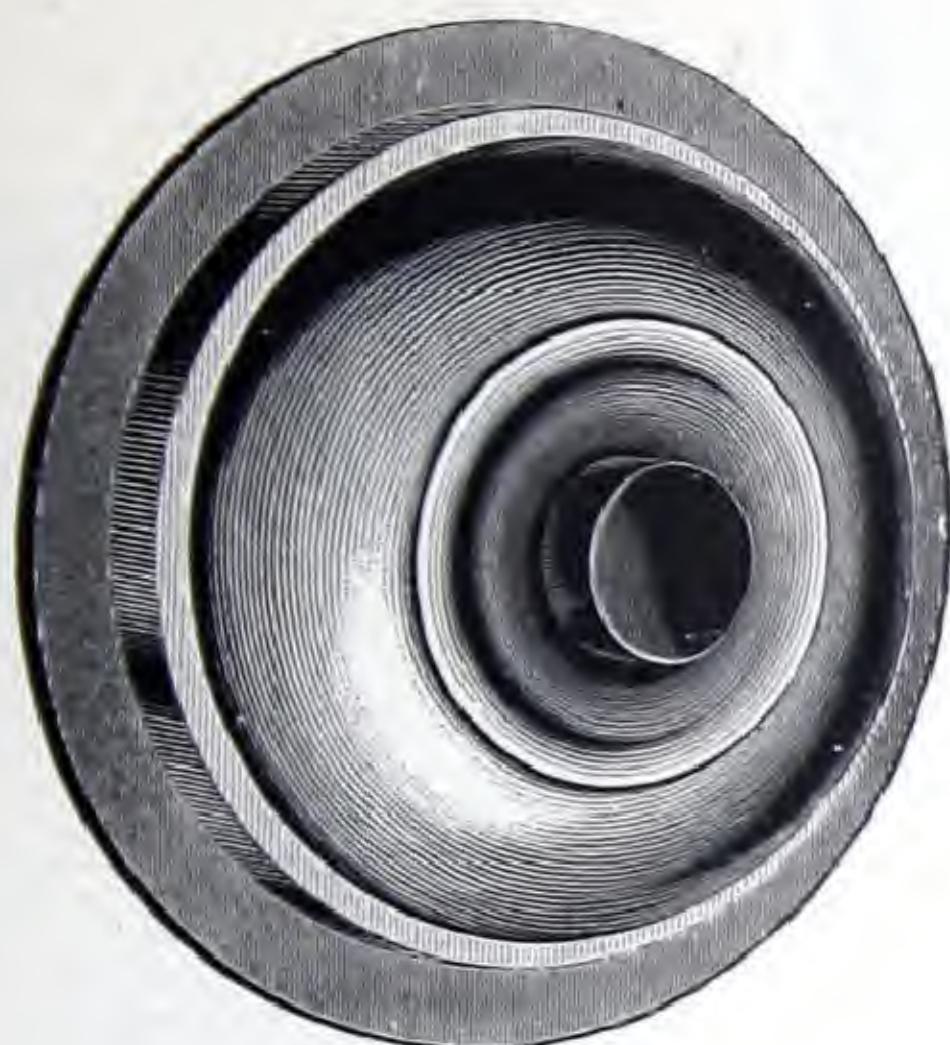
Half Actual Size.
Cat. No. 570C.

Cat. No. 570C, per 100, \$26.00

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Solid Bronze Push Buttons.



Cat. No. 577.



Cat. No. 587.

PRICE LIST.

CAT. NO.	PRICE.
577. Screw Top, 2½ ins. in size	\$.60
577A. Spun Bronze	.25
587. 2¼ ins. in size,	.45

German Silver Contacts.

Unless otherwise ordered, Metal Pushes will be sent in Light Bronze.



Cat. No. 598.



Cat. No. 605, Royal.

PRICE LIST.

CAT. NO.	PRICE.
598. Screw Top, 2½ ins. in size	\$.82
605. Royal. Screw Top, 2½ ins. in size	.80

THE HOLTZER-CABOT ELECTRIC COMPANY.

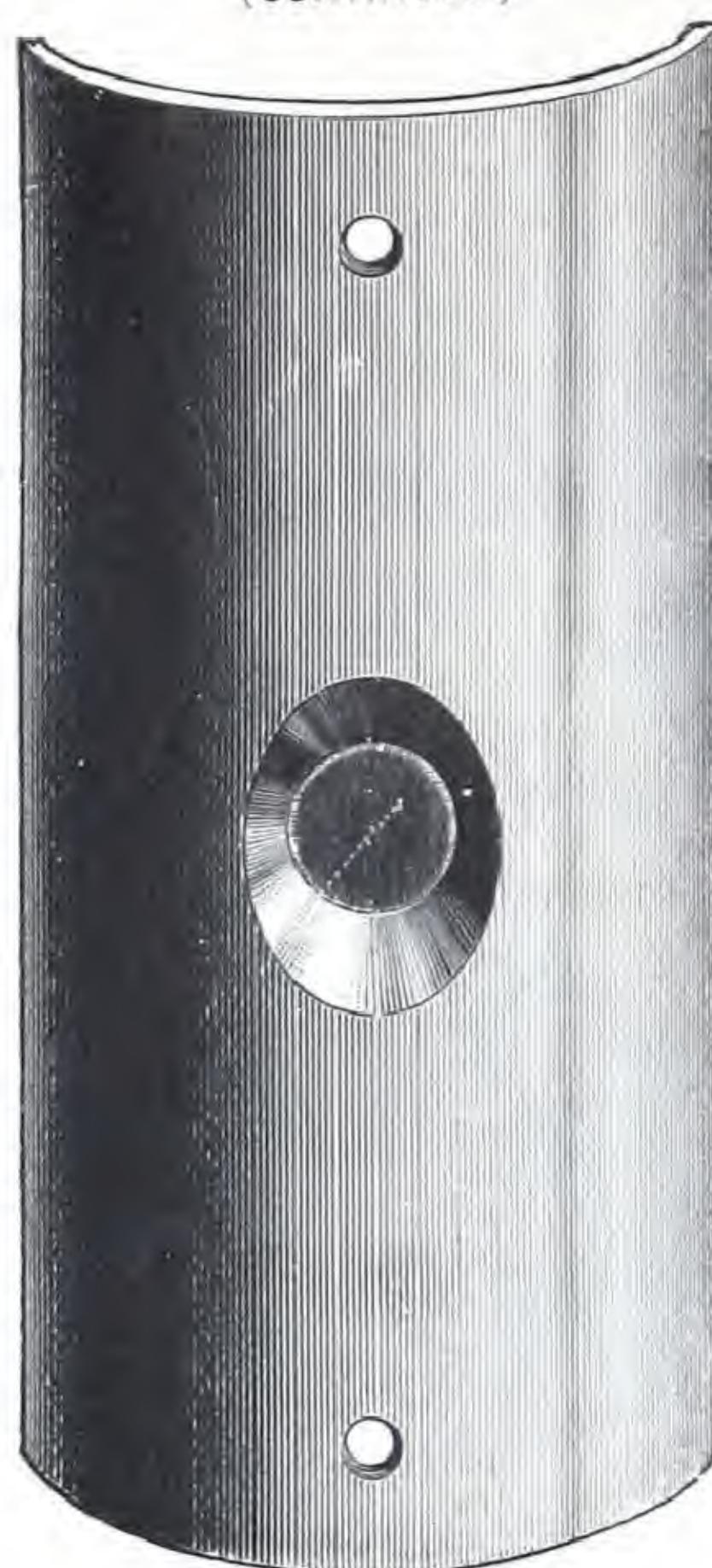
Boston, Mass.

Push Buttons.

(CONTINUED.)



Cat. No. 626.



Cat. No. 1266C.



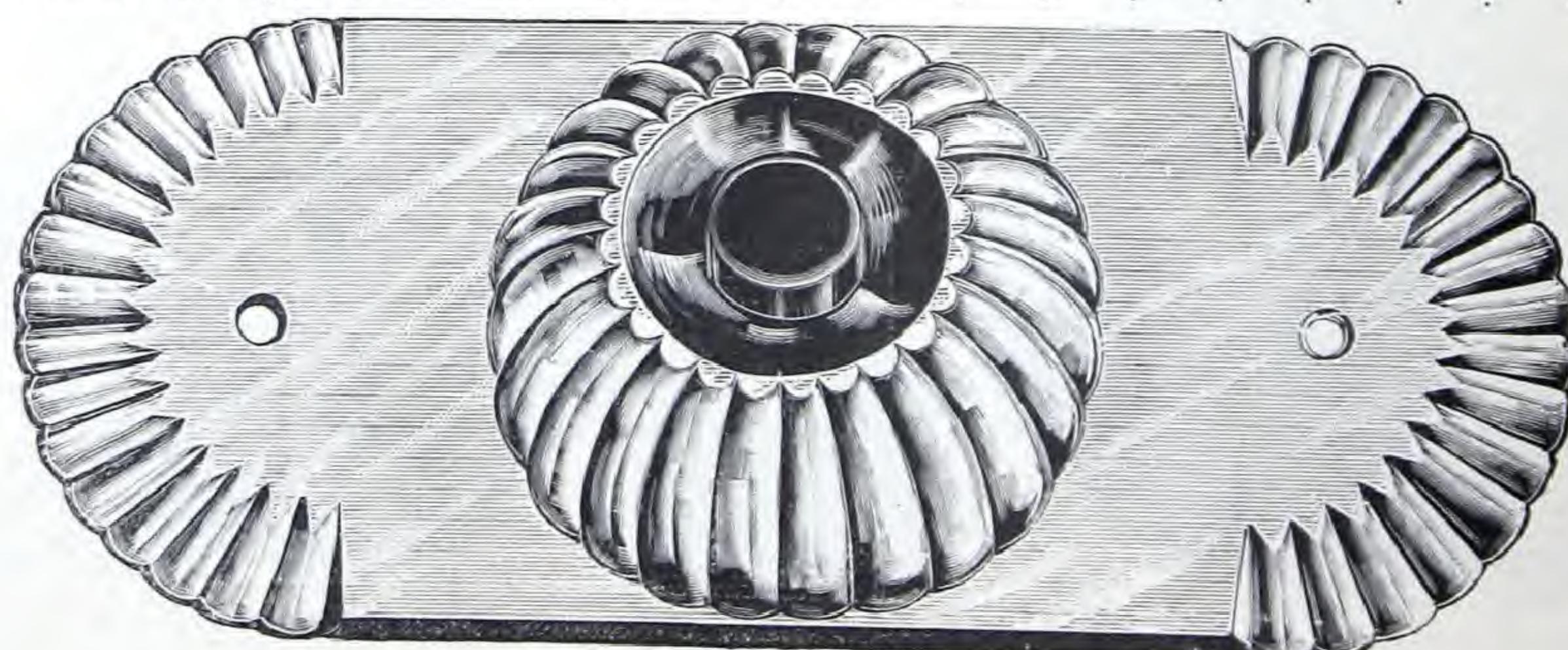
Cat. No. 628.

CAT. NO.

626. Size, $5\frac{1}{2}$ x $1\frac{3}{4}$ ins.
1266C. Size, $1\frac{1}{2}$ x 4 ins.
628. Size, $1\frac{3}{4}$ x $5\frac{3}{8}$ ins.

PRICE LIST.

PRICE.
\$.68
1.50
.86



Cat. No. 4444.

Size, $4\frac{1}{8}$ x $1\frac{7}{8}$, price

\$.75

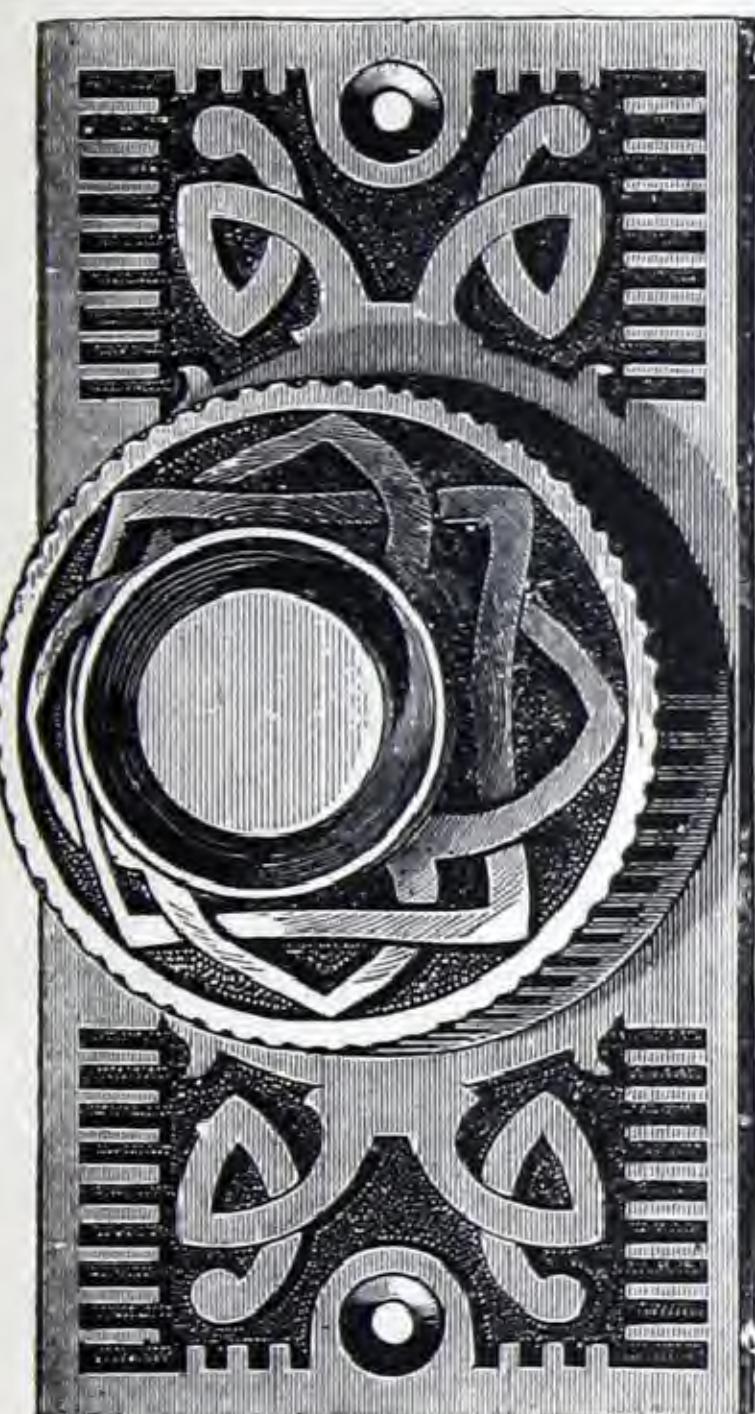
NOTE.—Metal Pushes are always sent in Light Bronze, unless otherwise ordered. Special Finishes will be charged at a reasonable advance.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Push Buttons (continued).

Cat. No. 592



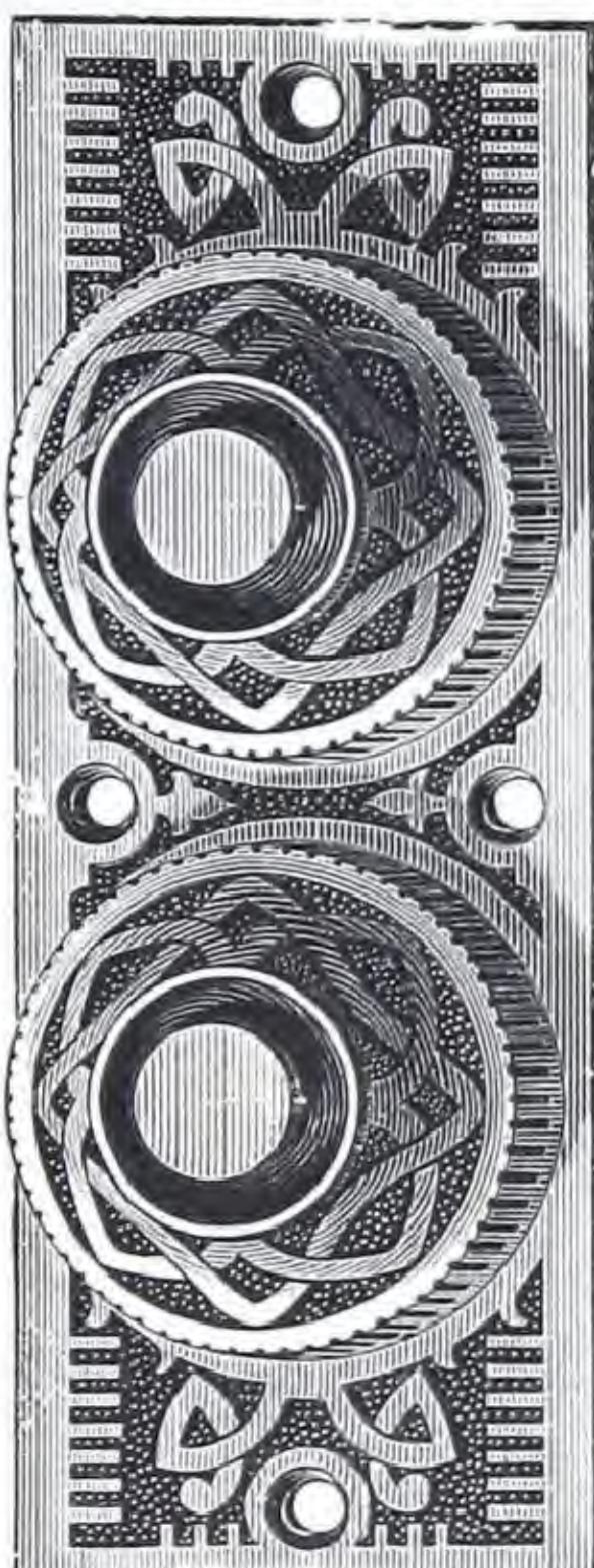
Size 4 x 2; price 80 cents.

Cat. No. 637.



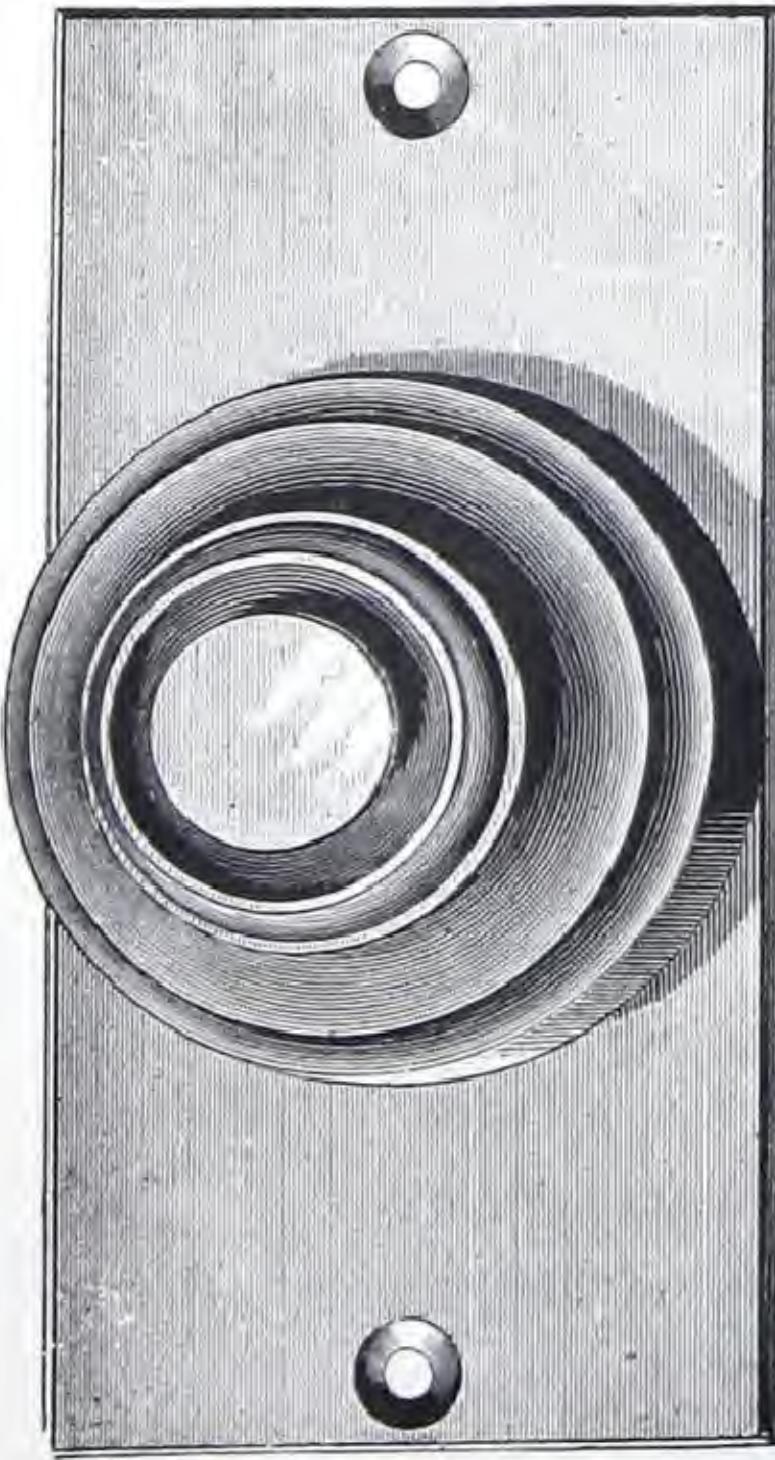
Size 5 x 2 $\frac{5}{8}$; price \$1.18.

Cat. No. 590.



Double Push Button.
Size 6 x 2 $\frac{1}{4}$; price \$1.62.

Cat. No. 616.



Size 4 x 2; price 80 cents.

Cat. No. 615.



Size 5 x 2 $\frac{5}{8}$; price \$1.25.

Cat. No. 614.



Full Size; price 60 cents.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

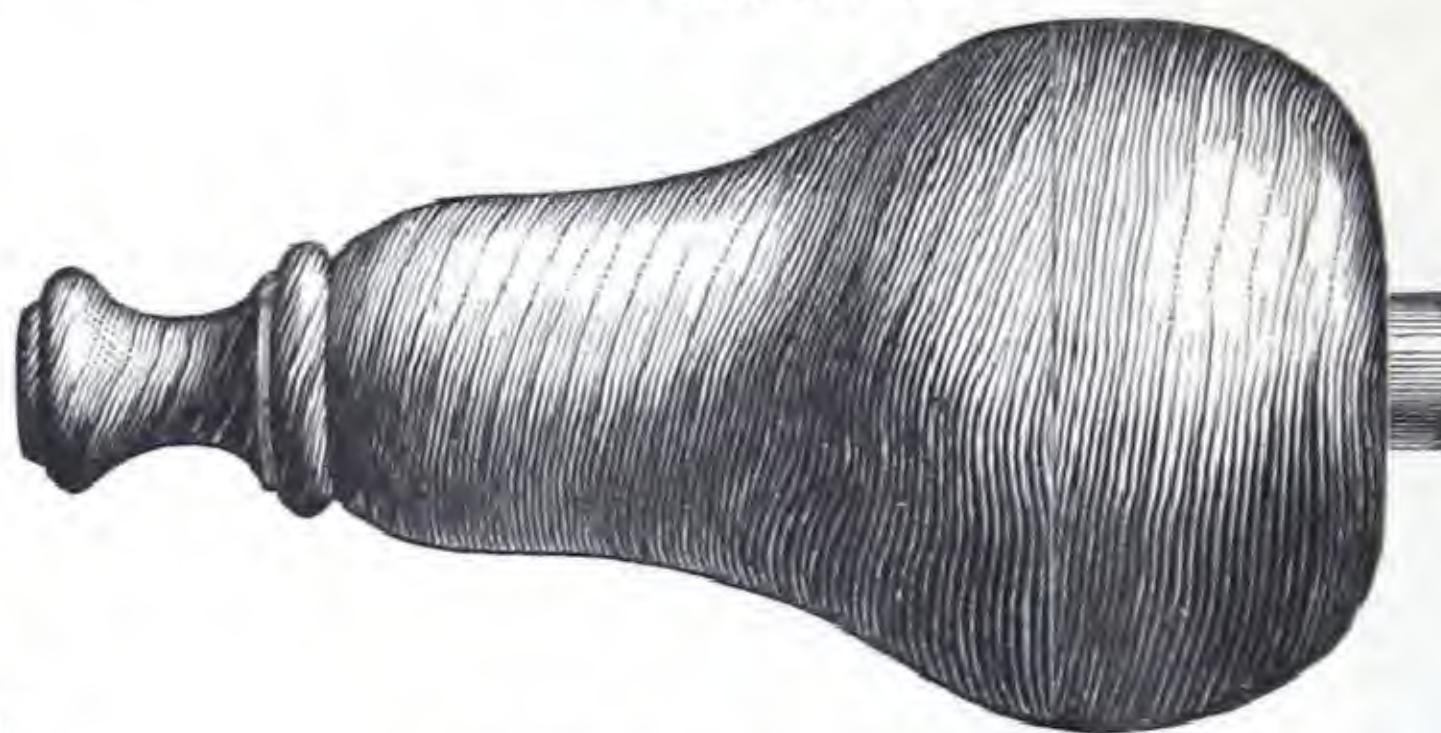
Boston, Mass.

Pear Pushes, Floor Pushes, Table Connections, Etc.

Cat. No. 7777.



Cat. No. 682.



OAK, ASH AND WALNUT.

Each 50 cts.

Cat. No. 5555.

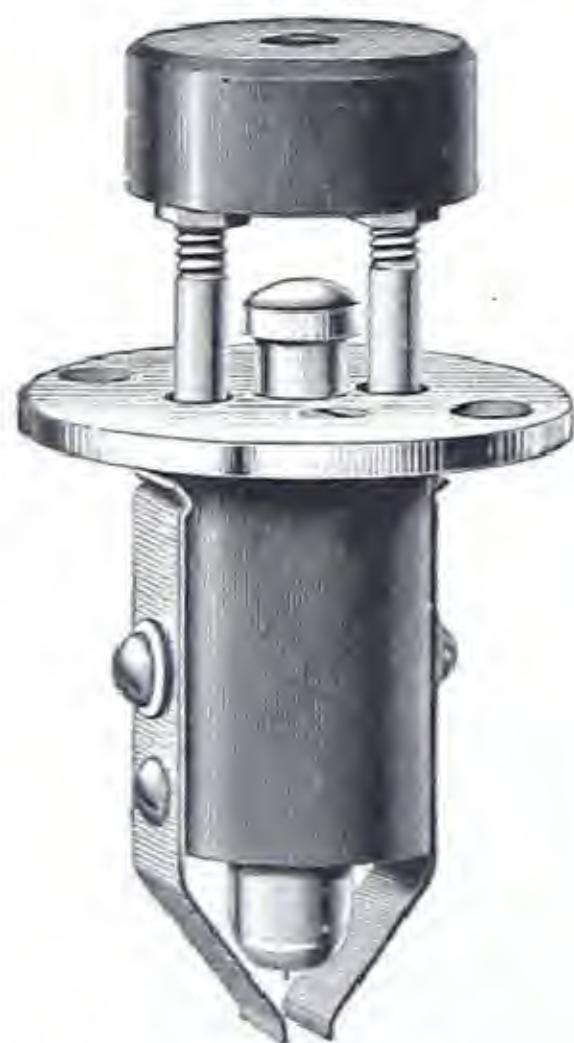


Half Actual Size.

In Oak, Walnut, Cherry or Mahogany.

Each 60 cents.

"O.K." Combination Push.

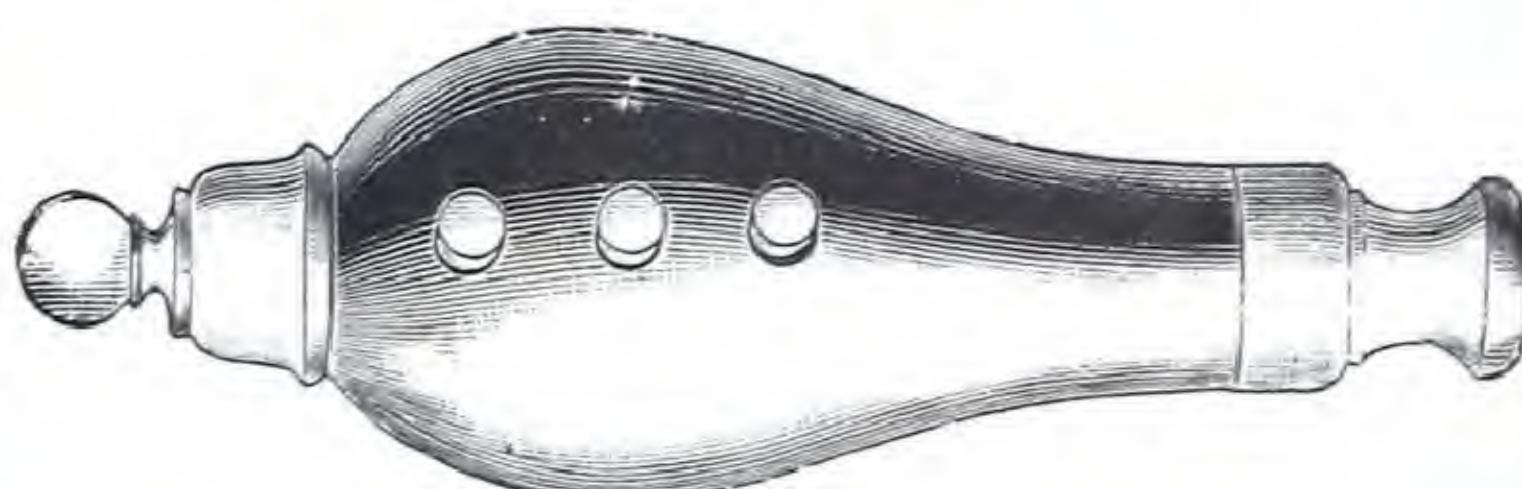


Cat. No. 707.

Cut Two-Thirds Actual Size.

Price . . . 75 cts.

MULTIPLE PEAR PUSHES.



Cat. No. 700. 2 Buttons \$2.60

" " 701. 3 " 3.35

" " 702. 4 " 4.15

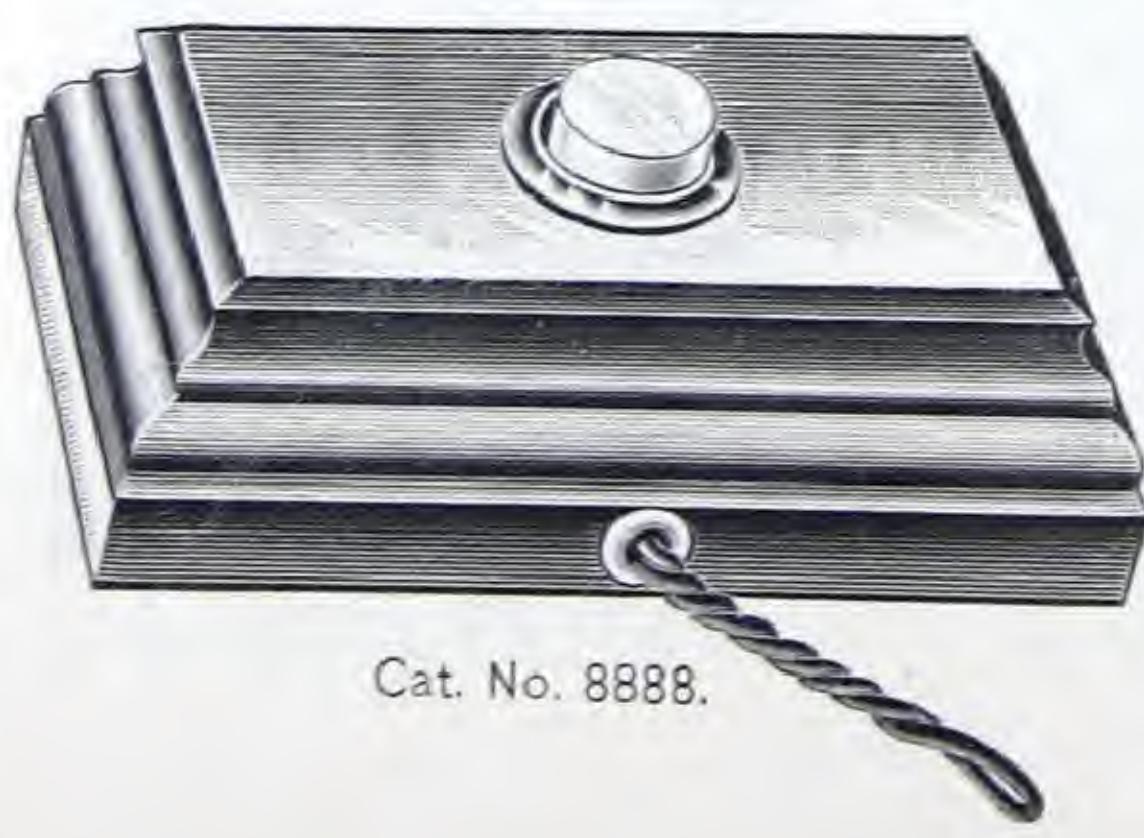
LARGER SIZES TO ORDER.

" H.-C." Plain Foot Push.



Cat. No. 708.

Price 50 cts.



Cat. No. 8888.

TABLE PUSHES.

HEAVILY WEIGHTED.

PRICE.

Cat. No. 8888 . . . Each \$1.40

Cat. No. 9999 . . . " .40

ANY WOOD.

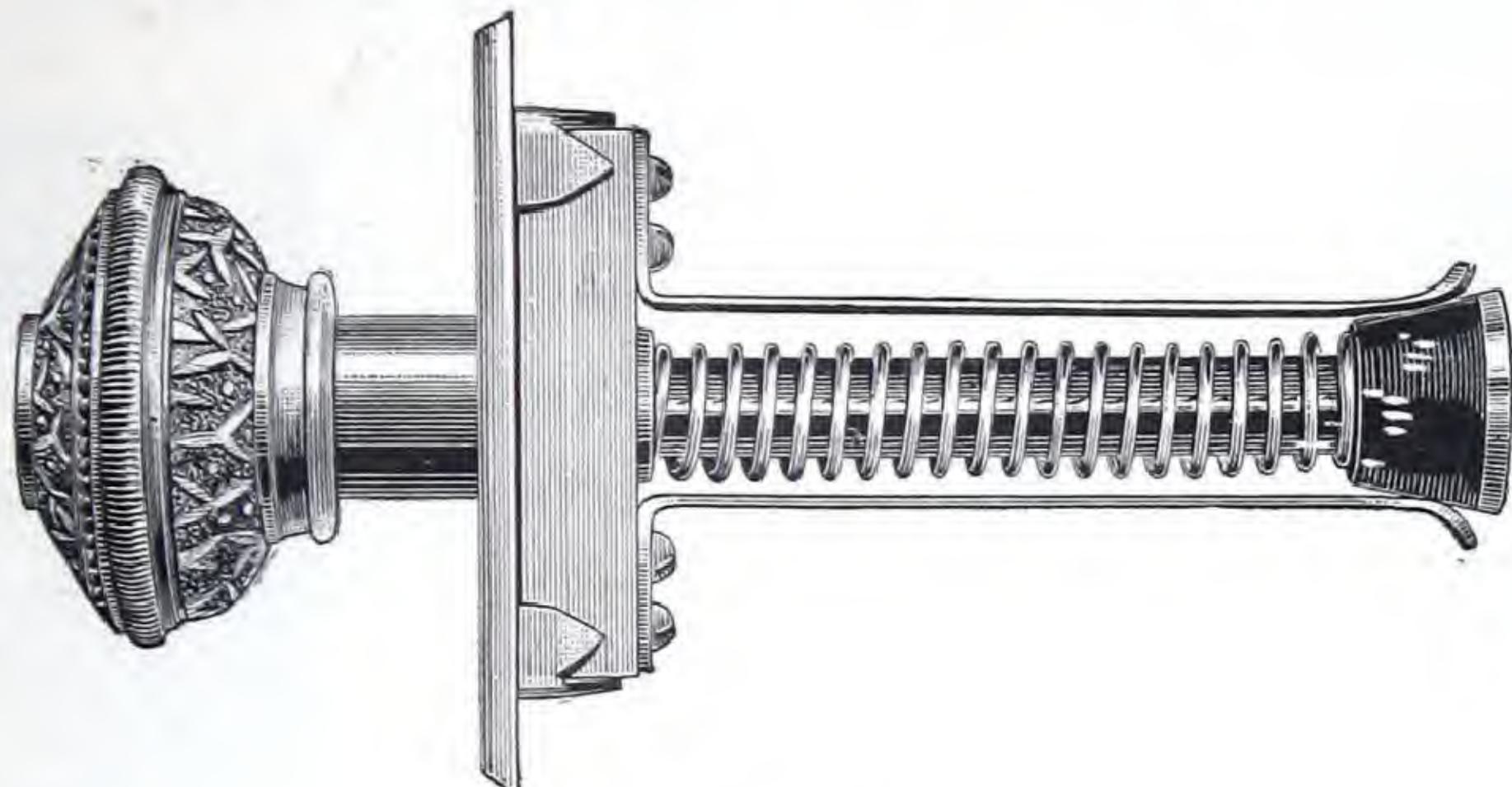


Cat. No. 9999.
Half Actual Size.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Bronze Electric Bell Pulls.



Cat. No. 736.

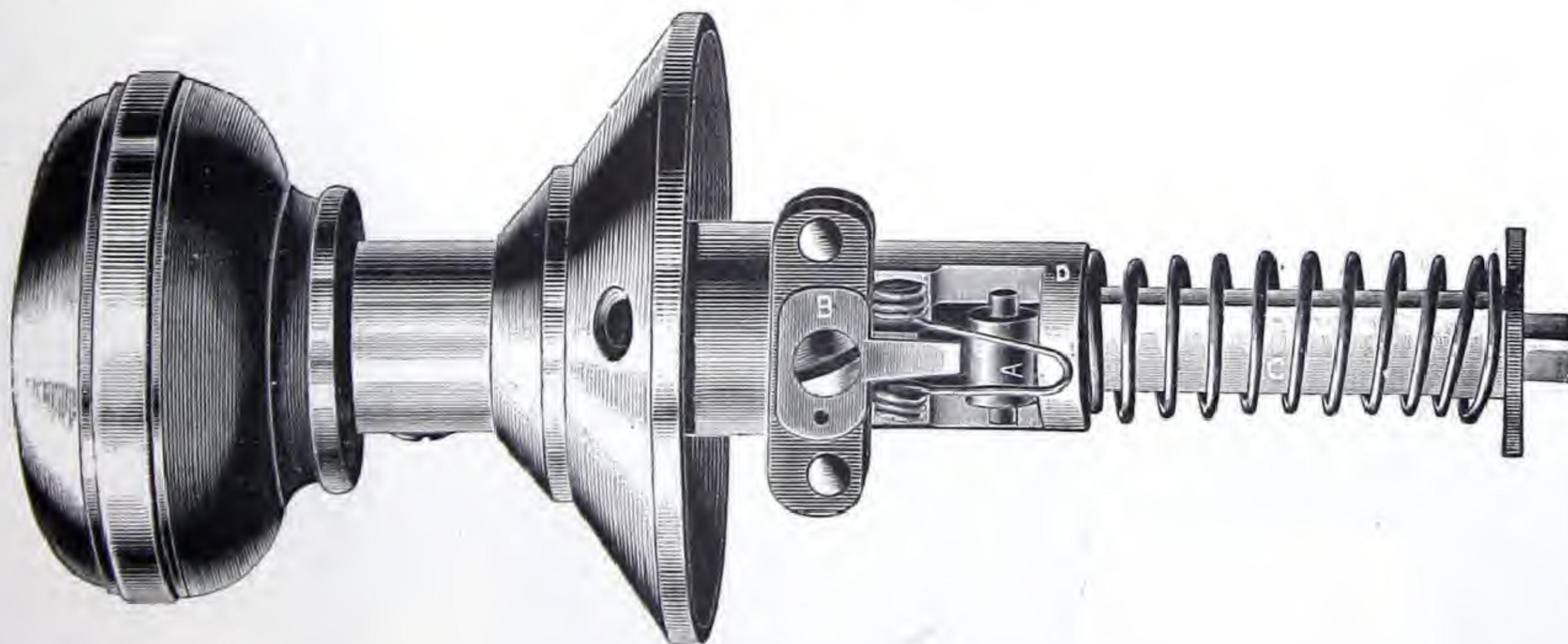
PRICE.

Cat. No. 736. Light or Dark Bronze \$2.10

Light Bronze is sent unless otherwise specified.

NOTE.—We fit pulls sent us, as illustrated above. Price for ordinary fitting, \$1.50.

The Eclipse Bell Pull Attachment.



PRICE.

Cat. No. 490A. Each \$0.50

May be readily attached to any Bell Pull.

GIVE CATALOGUE NUMBERS IN ORDERING.

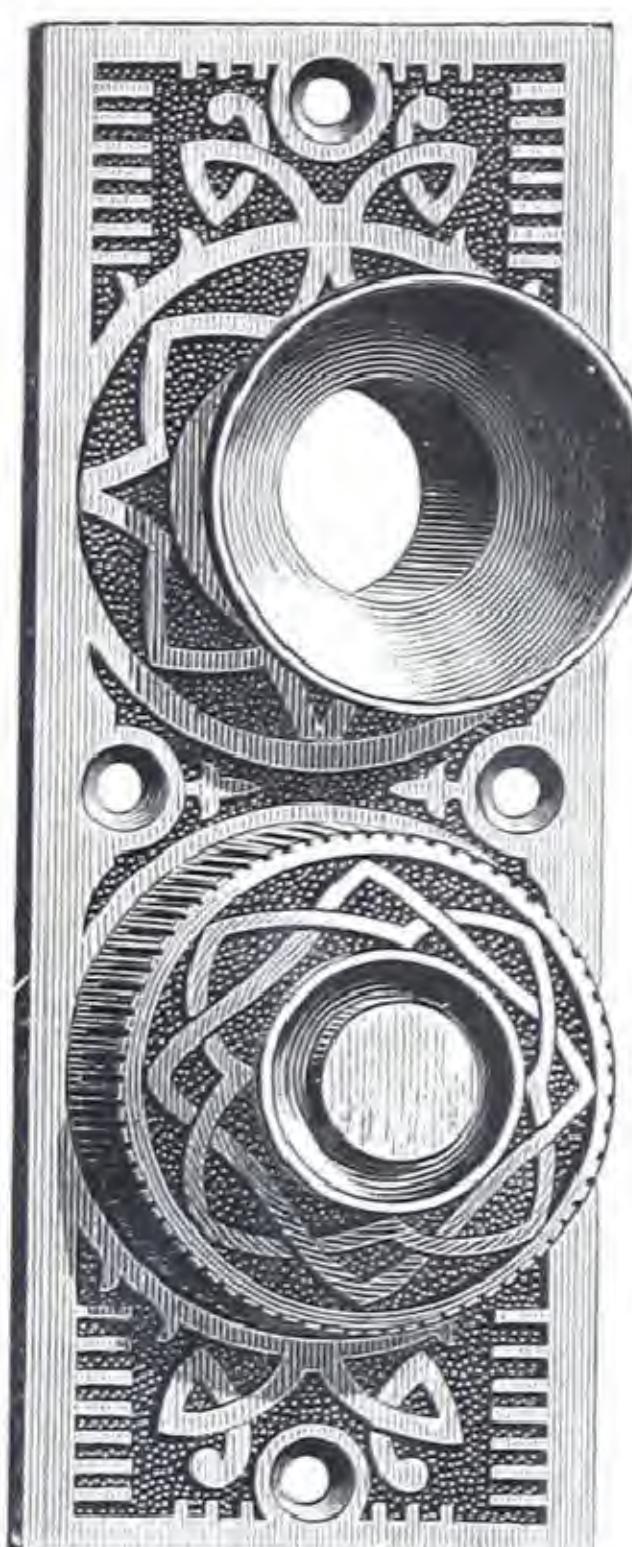
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Apartment House and Speaking Tube Material.

PUSHES AND MOUTH PIECES COMBINED.

Style A.

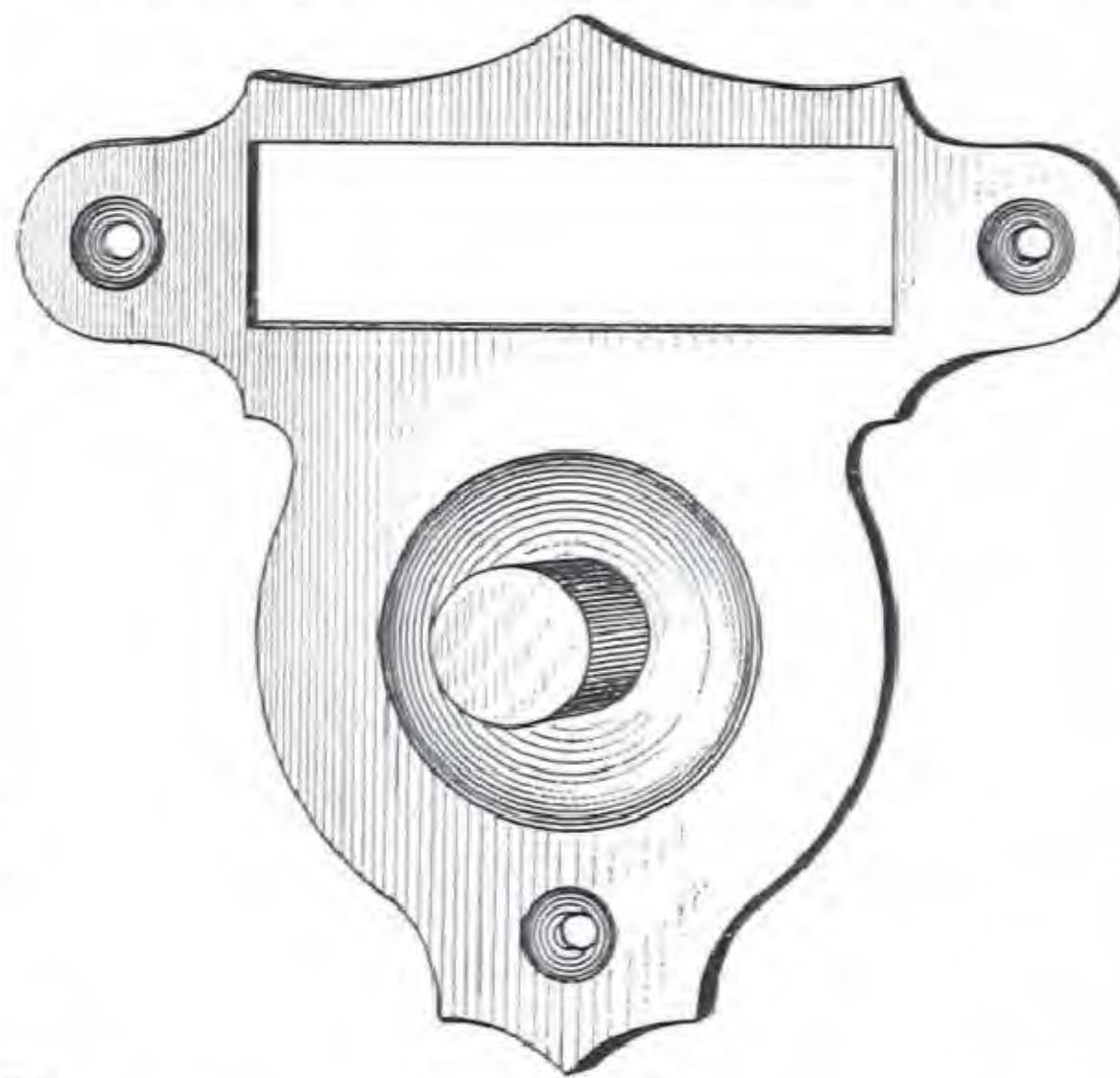


Cat. No. 657. Size 6 x 2 1/4.
Price \$1.62, complete.

STATE FINISH DESIRED.

NICKEL OR BRASS,
SAME PRICE.

PUSH BUTTON AND NAME PLATE.



Cat. No. 659.

Price \$1.12

Style B.



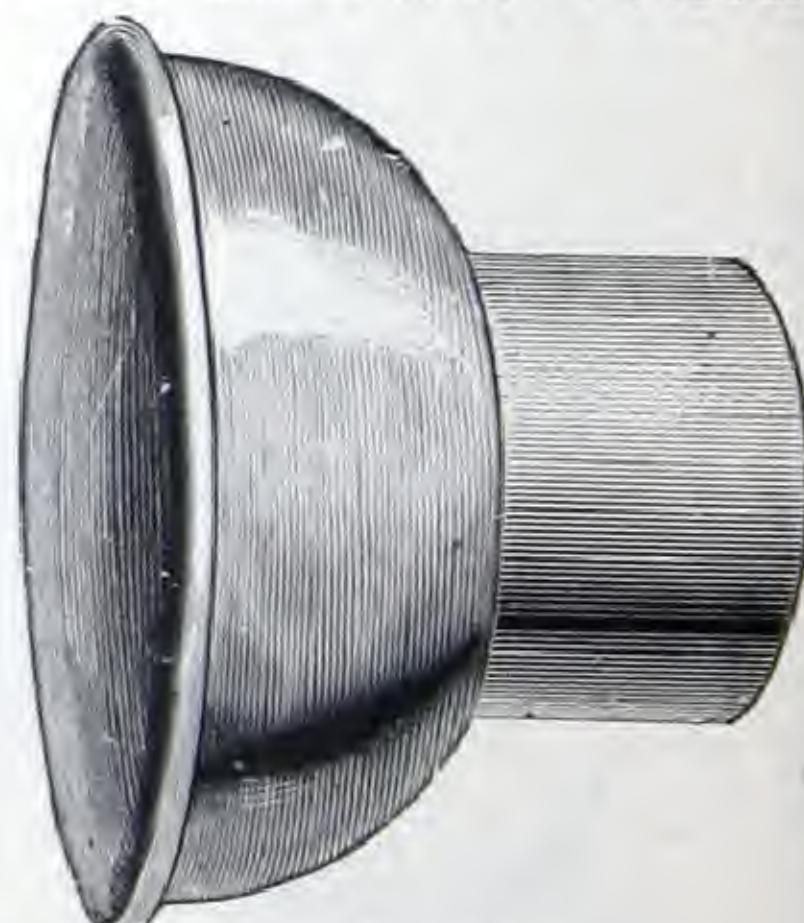
Cat. No. 668. Size 5 1/2 x 2 5/8.
Price \$1.25, complete.

FLUSH BRASS MOUTH PIECE.



Cat. No. 243I.
Price . . . \$3.00 doz.

OPEN BRASS MOUTH PIECE.



Cat. No. 241B.
Price . . . \$2.00 doz.
EXACT SIZE.

NICKEL WASHERS.



Cat. No. 241I.
Price . . . \$1.00 doz.
ANY SIZE.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Apartment House and Speaking Tube Supplies.

(CONTINUED.)

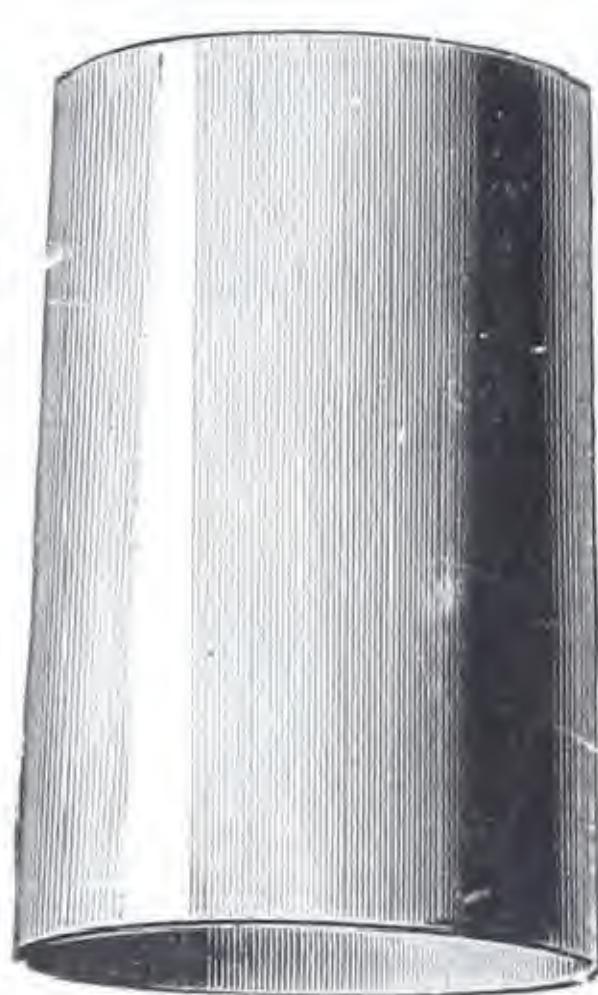
NICKEL FLANGE COLLARS.



Cat. No. 2316.

Price per dozen . . \$4.00

NICKEL COLLARS.



Cat. No. 2317.

Price per dozen . . \$3.00

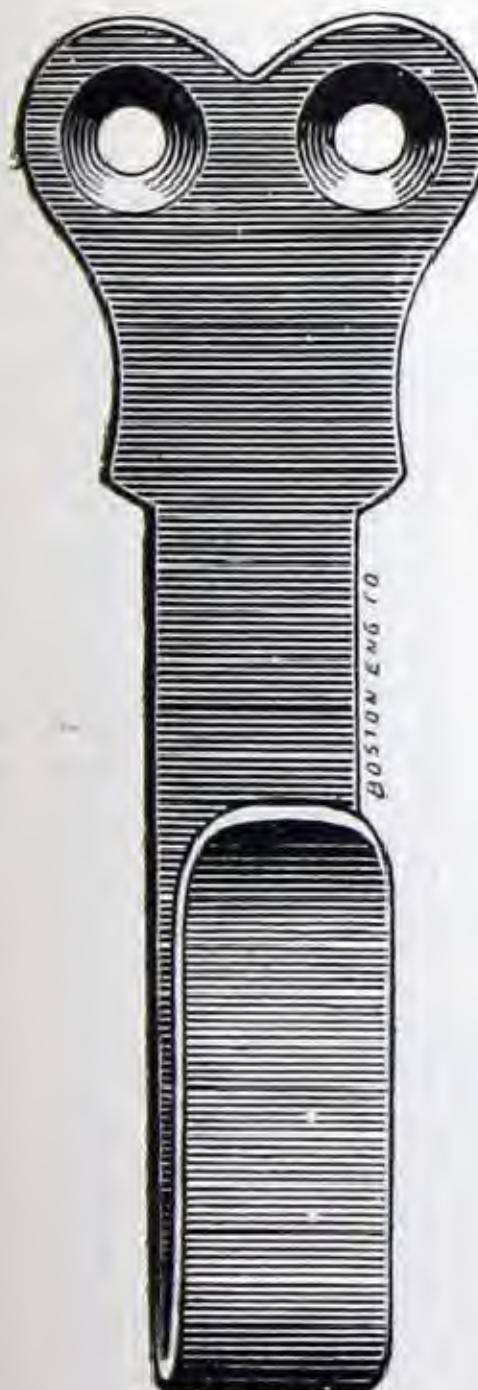
FLEXIBLE TUBE HOLDER.



Cat. No. 2318.

Price per dozen . . \$3.00

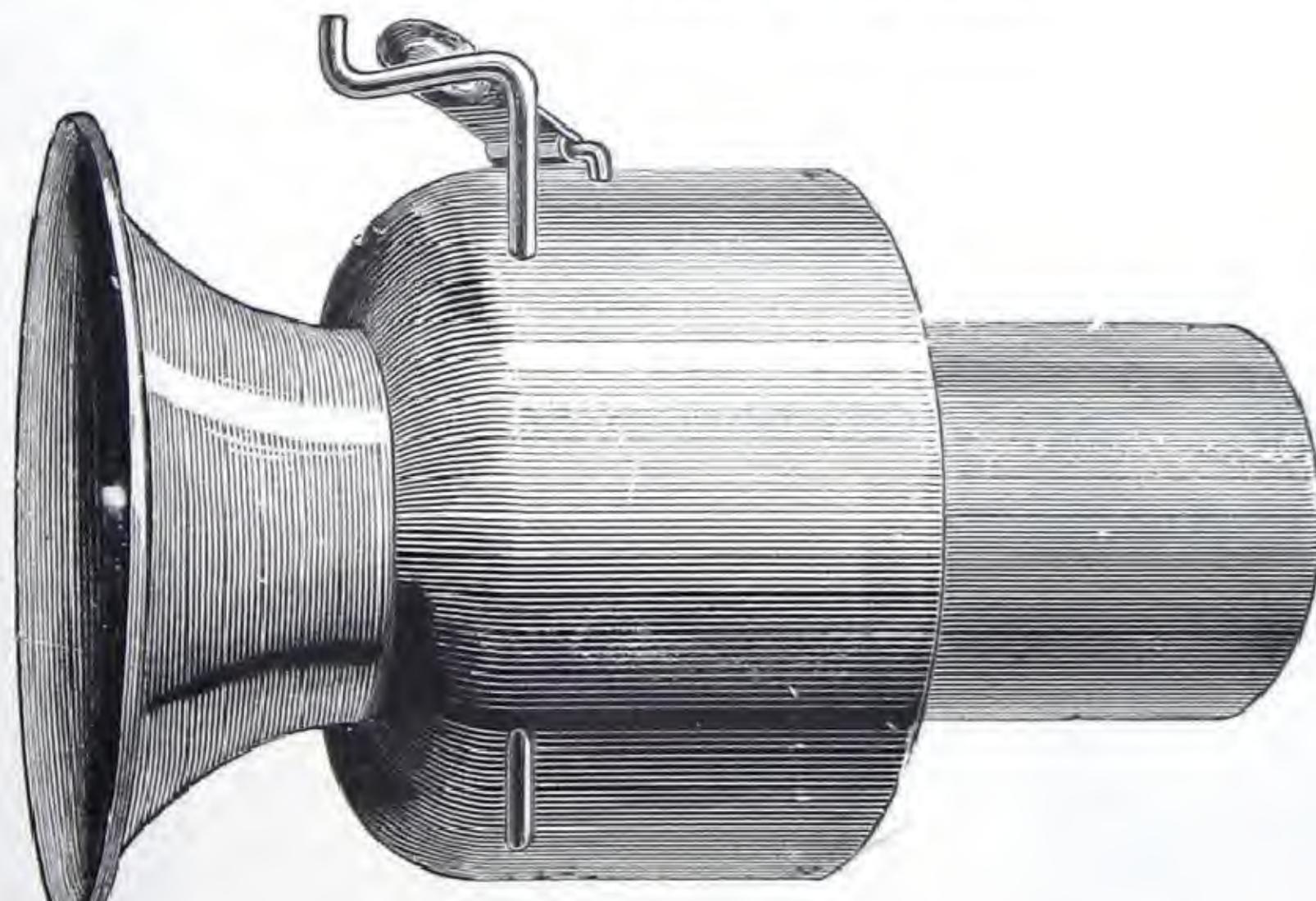
FLEXIBLE TUBE HOLDER.



Cat. No. 2315.

Price per doz. . . \$3.00

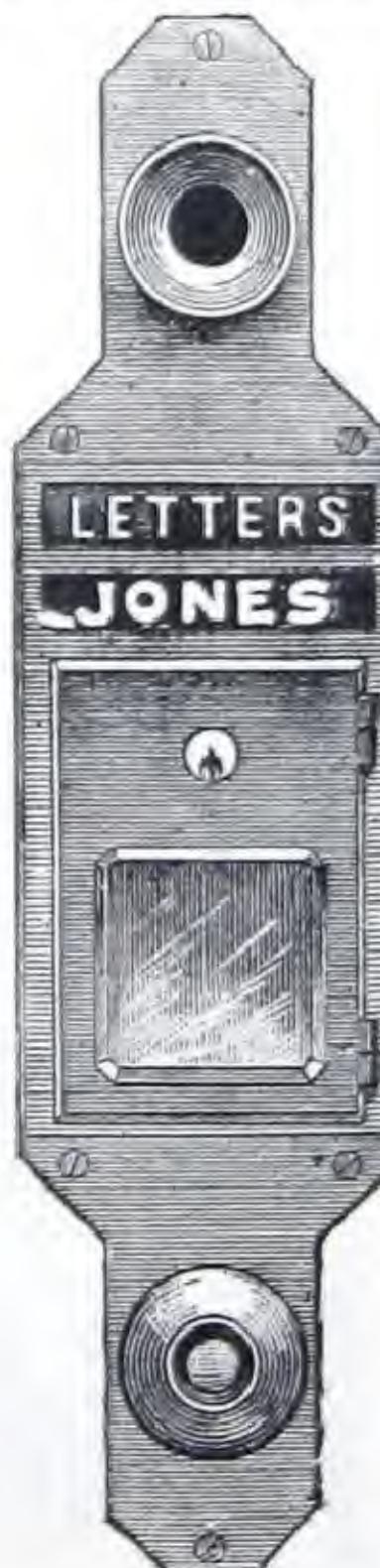
SPEAKING TUBE WHISTLES.



Cat. No. 2394.

Price per dozen . . \$3.00

LETTER BOXES.



Cat. No. 2175.

Price complete . . \$4.00

GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Apartment House and Speaking Tube Supplies.

SPEAKING TUBE.



SPEAKING TUBE.

5 FOOT LENGTHS.

PRICE LIST.

CAT. NO.	PRICE.
2323. 1 in., per 100 ft.	\$2.25
2324. 1 1/4 " " "	4.50
2325. 1 1/2 " " "	6.75

ELBOWS AND CONNECTIONS.

PRICE LIST.

CAT. NO.	PRICE.
2330. 1 inch Oct. per 100	\$4.75
2331. 1 1/4 " " "	8.00
2332. 1 1/2 " " "	13.25
2334. 1 " Sq. " "	2.75

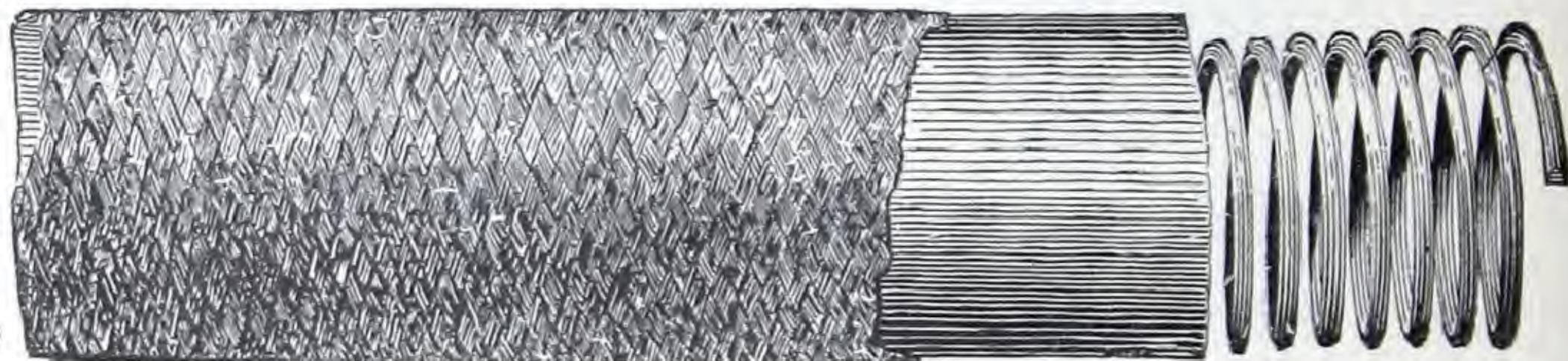
CAT. NO.	PRICE.
2339. 1 inch Connections	\$8.25
2340. 1 1/4 " " "	12.00
2341. 1 1/2 " " "	16.00

FLEXIBLE TUBE.

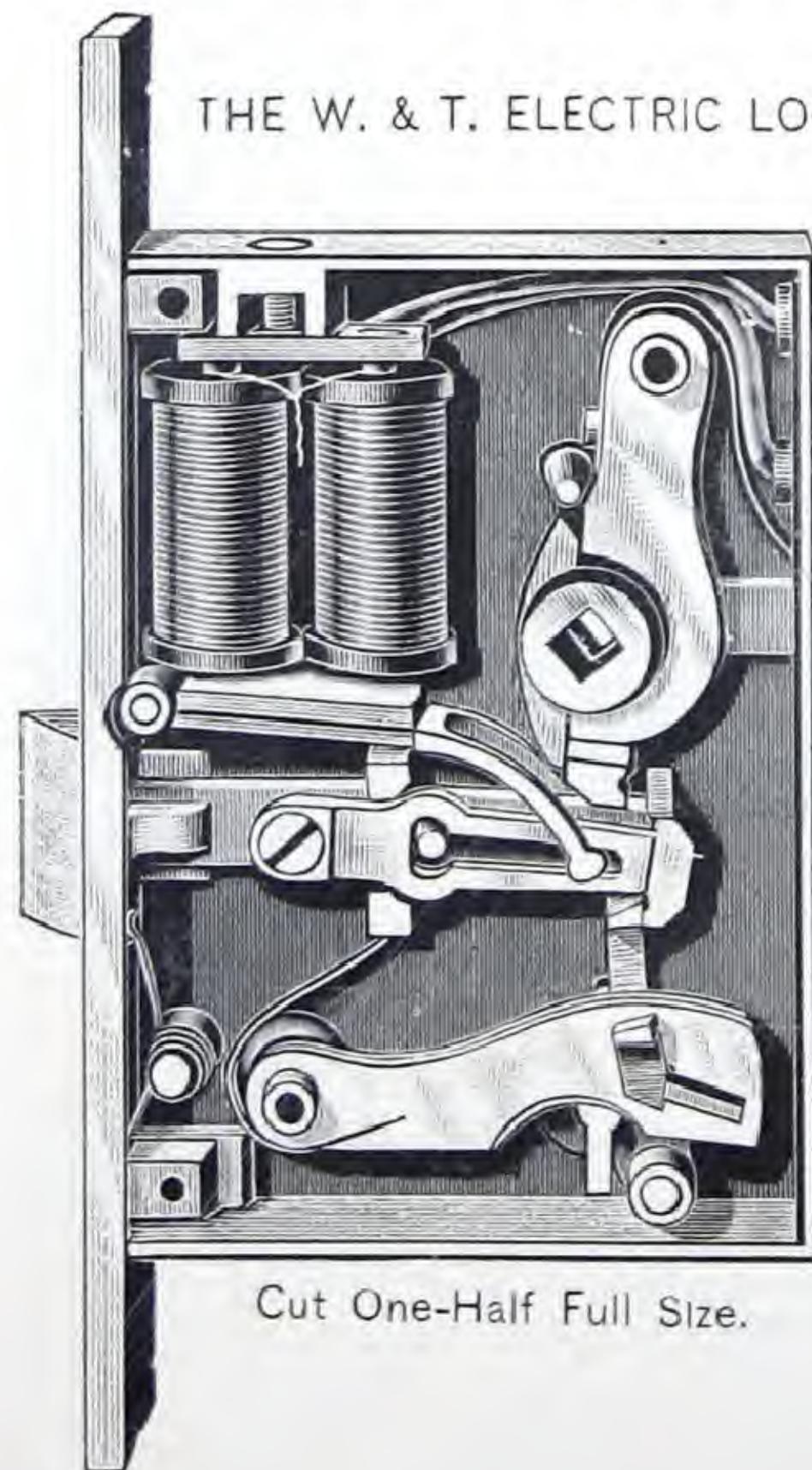
(MOHAIR.)

Cat. No. 2312.

Price per foot 1 inch
diameter . . . \$.60



ELECTRIC LOCKS AND DOOR OPENER.



THE W. & T. ELECTRIC LOCK. W. & T. DOOR OPENER.

Right or Left Handed.

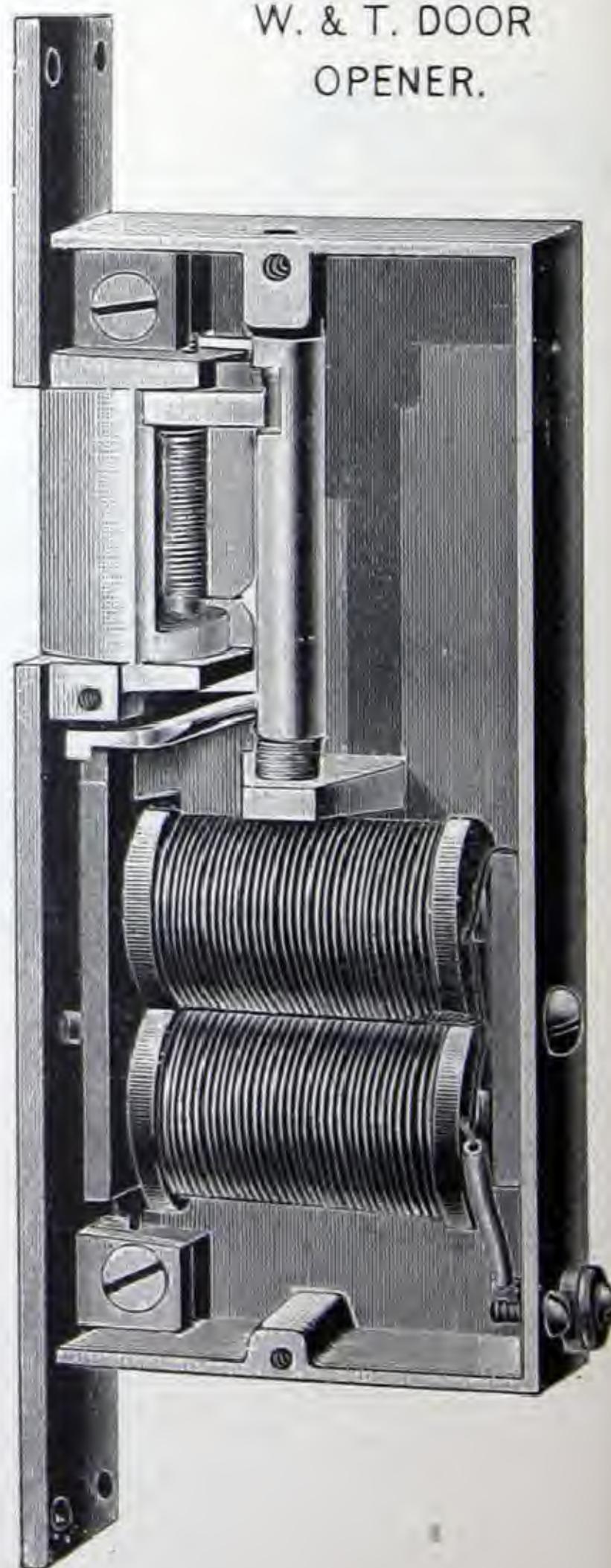
Price complete, . . . \$4.00

THE W. & T. ELECTRIC
LOCK.

A Door Opener and Lock
Combined.

Price complete, . . . \$12.00

GIVE CATALOGUE NUMBERS IN
ORDERING.



Cut One-Half Full Size.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Wires for Household and Office Work.

ANNUNCIATOR OR BURGLAR ALARM WIRE.

DOUBLE WOUND.

B. & S. Gauge, from No. 12 to 20, inclusive, on spools 8 to 10 lbs., per lb. \$0.34

Each size in solid or combination colors, and warranted in all respects.

APPROXIMATE WEIGHTS: No. 18, 160 ft.; No. 19, 200 ft.; No. 20, 225 ft. per lb.

All Sizes and Colors in Stock.

OFFICE WIRE.

Wind and Braid, or Double Braided, According to Size.

B. & S. Gauge, from No. 12 to No. 20, inclusive, in coils 8 to 15 lbs., per lb. \$0.35

Each size in solid or combination colors, and warranted in all respects.

APPROXIMATE WEIGHTS: No. 12, 35 ft.; No. 14, 55 ft.; No. 16, 95 ft.; No. 18, 135 ft.; No. 19, 145 ft.; No. 20, 155 ft. per lb.

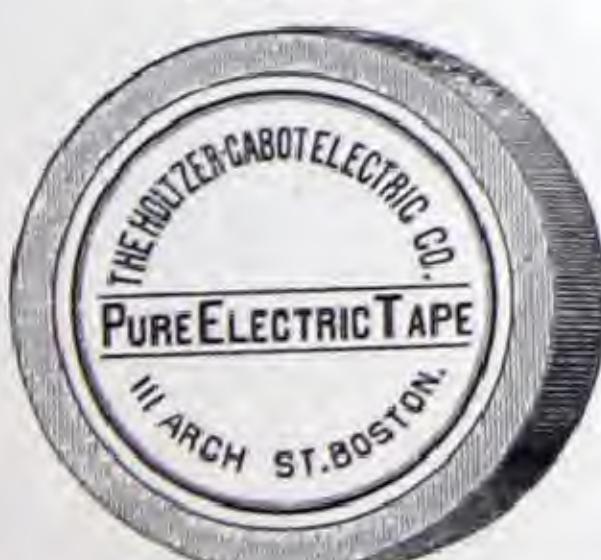
SILK CONDUCTING CORD.

Especially used for Pear Shaped Pushes and Presselles.

Per yard \$0.12

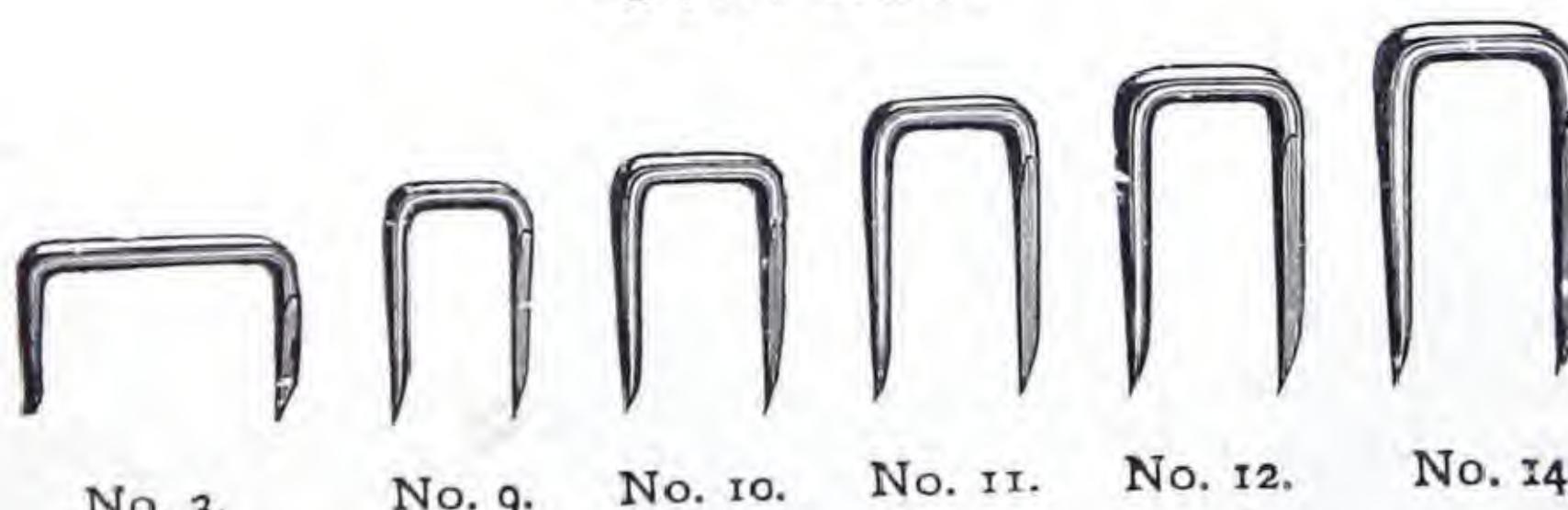
COLORS, — Green, Red, Magenta, Drab.

Cat. No. 704.



TAPES.

STAPLES.



No. 3. No. 9. No. 10. No. 11. No. 12. No. 14.

H. C. E. Co.'s RUBBER TAPES.

CAT. NO.	PRICE.										
2018. Tape, per lb.	\$0.90	Nos. 9, 10 and 11, per box,									\$0.10
2017. Splicing Compound, per lb.	1.20	No. 12, per box, . . . . .									.11

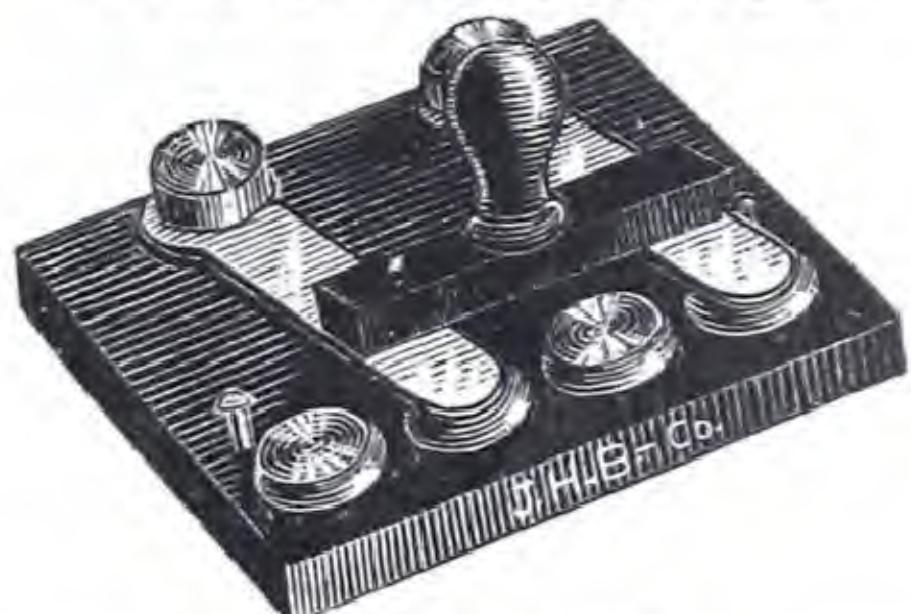
Cat. No. 2150.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Miscellaneous Supplies.

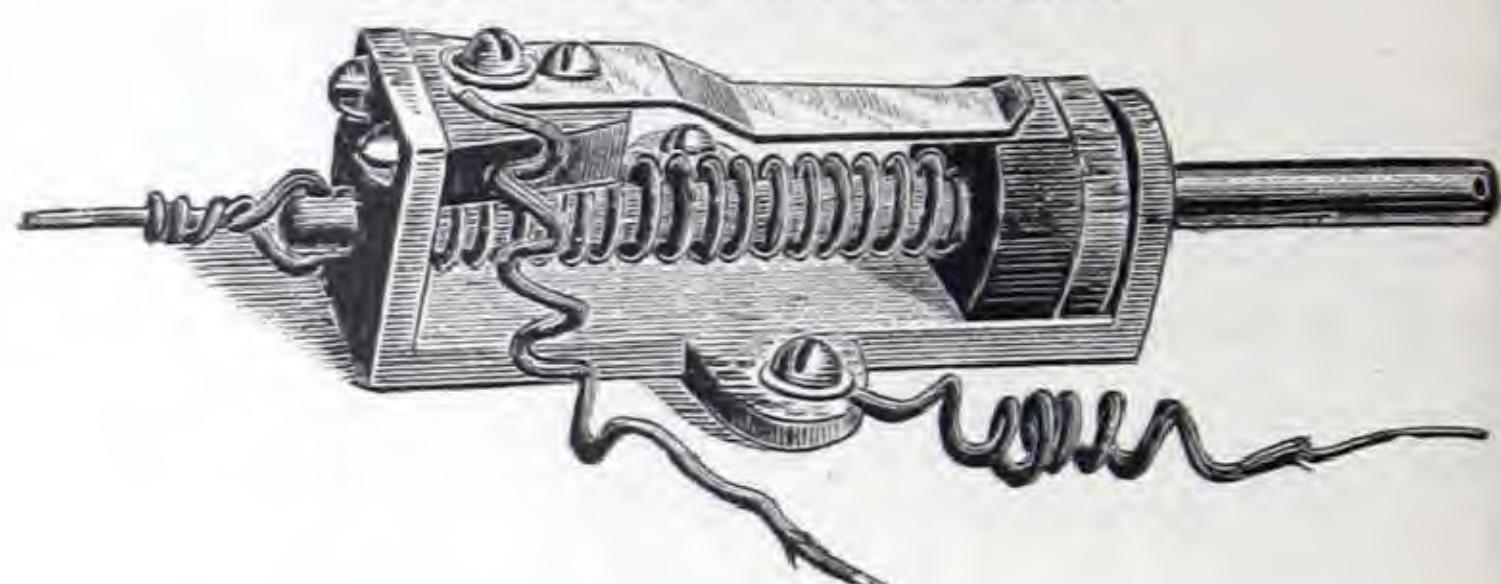
POLE CHANGING SWITCH.



Cat. No. 111 B.

Price, without Binding Posts, \$2.50
" with " " 3.00

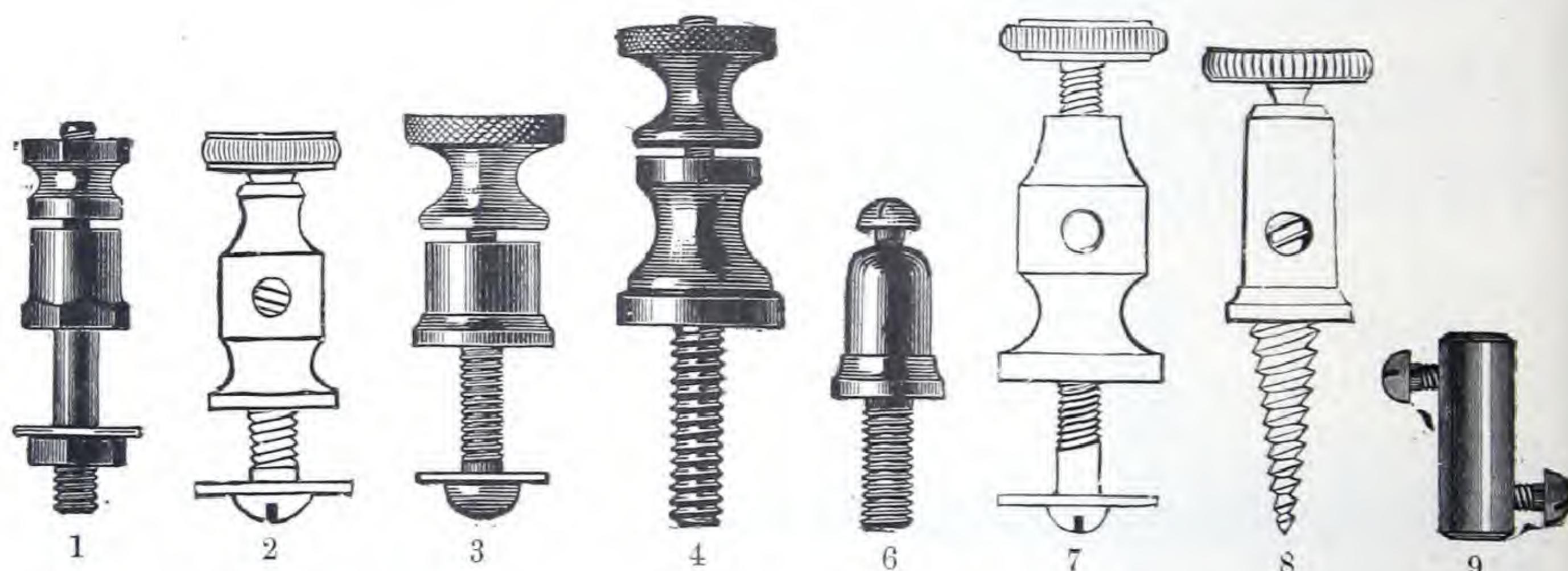
BELL PULL ATTACHMENT.



Cat. No. 737.

Price \$.54

BINDING POSTS AND CONNECTORS.



PRICE LIST.

CAT. No.

CAT. No.	PRICE.
479. No. 1 Binding Posts	each \$.08
480. " 2 " "	" 12
481. " 3 " "	" .12
482. " 4 " "	" .15
484. " 6 " "	" .08
485. " 7 " "	" .15
486. " 8 " "	" .12
487. " 9 Wire Connectors, for No. 12 to 18 wire	" .12
488. " 9 " " " " 8 to 12 "	" .15
489. " 9 " " " " 6 to 8 "	" .18
490. " 9 " " " " 2 to 6 "	" .24

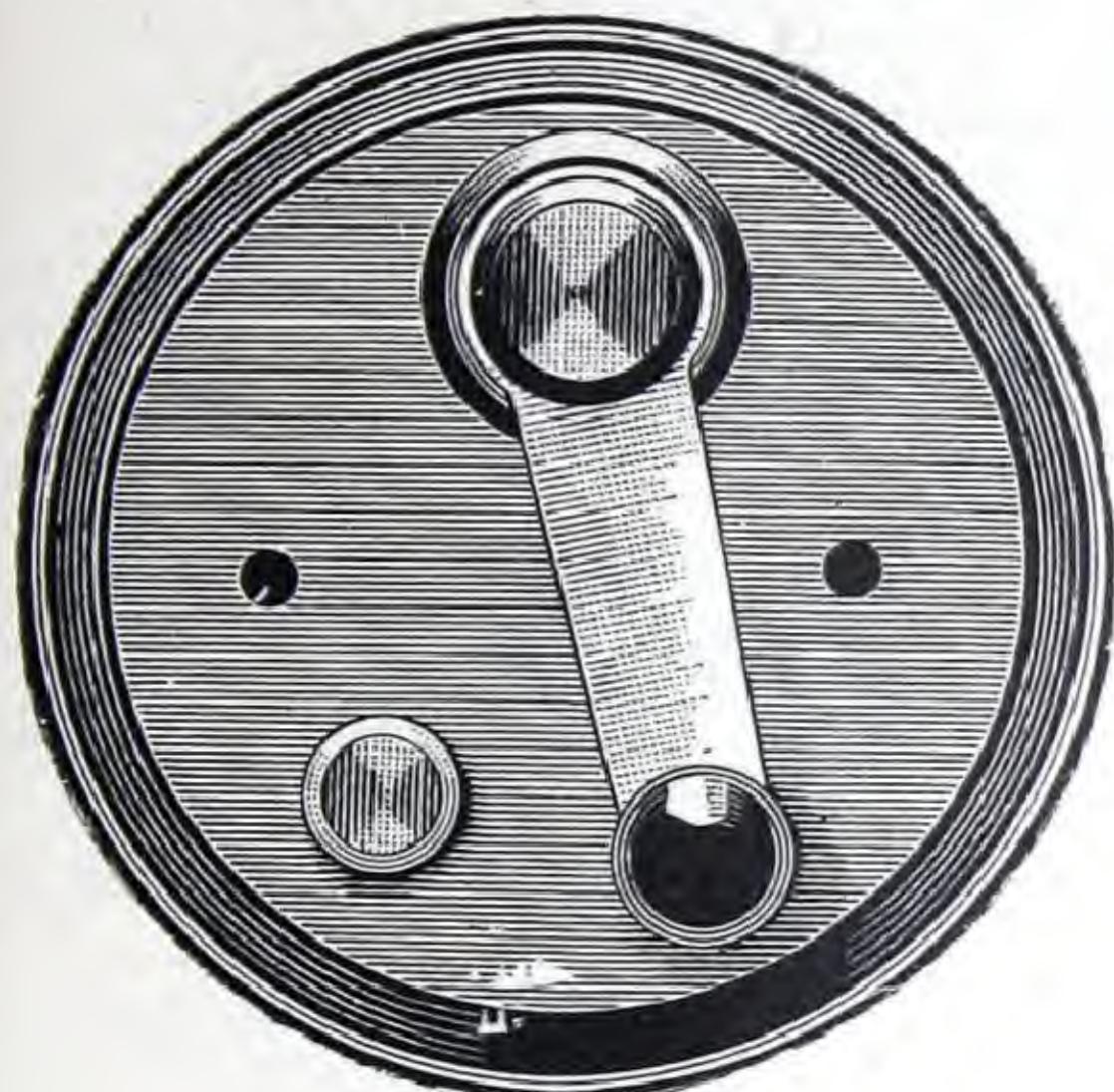
GIVE CATALOGUE NUMBERS IN ORDERING.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Miscellaneous Supplies.

WOOD BASE SWITCHES.



Cat. No. 712.

MULTIPLE WOOD BASE SWITCH.



The lever arm may be turned to any desired switch point, contact being made only when knob is pressed.

PRICE OF SWITCHES.

CAT. NO.	PRICE.
712. 1 Point	\$.30
713. 2 " " " " .	.33
714. 3 " " " " .	.36
715. 4 " " " " .	.40

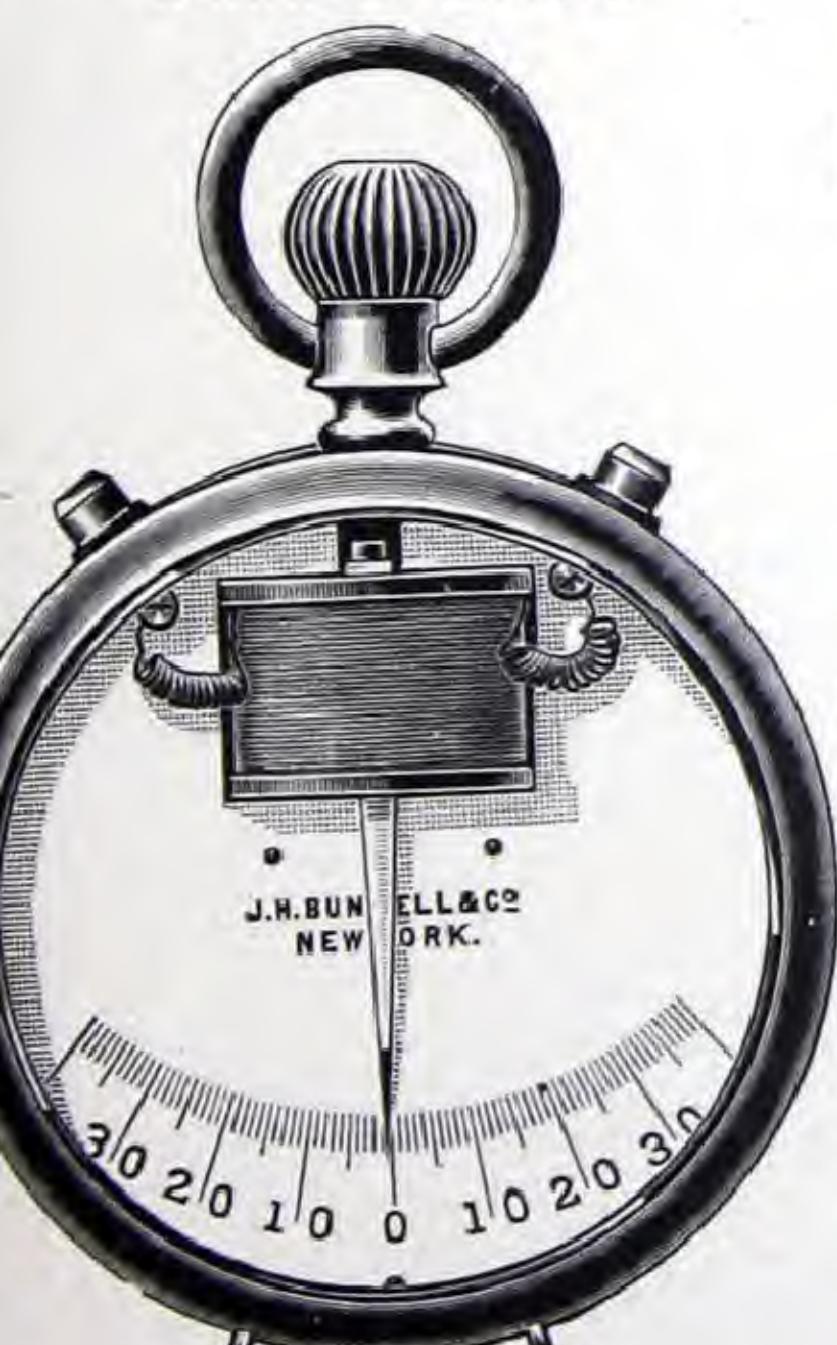
The Bases of these Switches are finely polished. Metal parts are nickel or polished bronze.

PRICE LIST.

2 Point Multiple Switch	\$.75
3 " " " " . . . .	.85
4 " " " " . . . .	.95

Add 10 cents per point for larger sizes.

BUNNELL GAUGE.



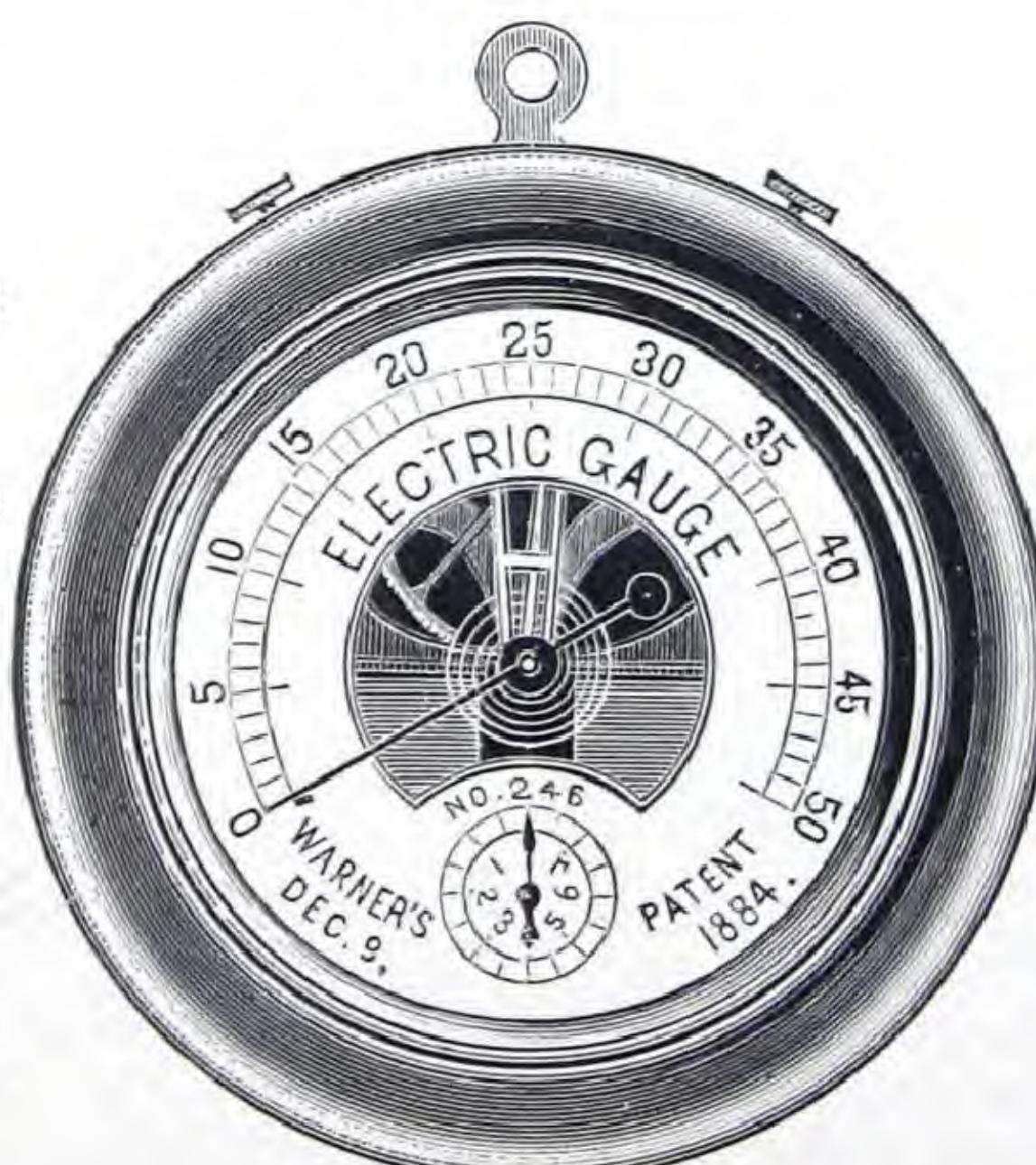
Cat. No. 1727 A.

Electric Gauges

For Testing Batteries
and Battery Circuits of

TELEGRAPH,
TELEPHONES,
ELECTRIC CLOCKS,
ETC.

WARNER GAUGE.



Cat. No. 1728.

Price \$9.00

Price \$14.34

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CCA

BUSINESS ESTABLISHED
1875

INCORPORATED
1889

Descriptive Catalogue

. . No. 24 . .

OF



DYNAMOS
MOTORS
CONTROLLERS
INDICATORS
SWITCHES, ETC.

MANUFACTURED BY

The Holtzer-Cabot Electric Co.

92 Franklin Street, Boston

Branch: No. 114 LIBERTY STREET, NEW YORK



Factory at Brookline, Mass.



Special Notice.

Boxing of Motors and Dynamos is charged at cost, **INVARIABLY**. No deviation will be made from this rule.

THE HOLTZER-CABOT ELECTRIC CO.
BOSTON, MASS.





Part II.

DYNAMOS, MOTORS, CONTROLLERS, INDICATORS, SWITCHES, ETC.





Introductory.

WE present for your examination this the fourth issue of our catalogue of Motors, Dynamos and kindred Specialties.

We make no efforts to compete in price with the inferior and low priced apparatus of this description, which is extensively advertised and sold to-day, but aim chiefly at the highest possible grade of machinery at moderate prices.

So carefully have we worked out each detail of theory and construction, that we feel certain we have reached a high standard of excellence in this class of machinery.

The specialties enumerated and described herein, possess the same good qualities which characterize our house goods which have been favorably known for many years past.

THE HOLTZER-CABOT ELECTRIC CO.
BOSTON, MASS.

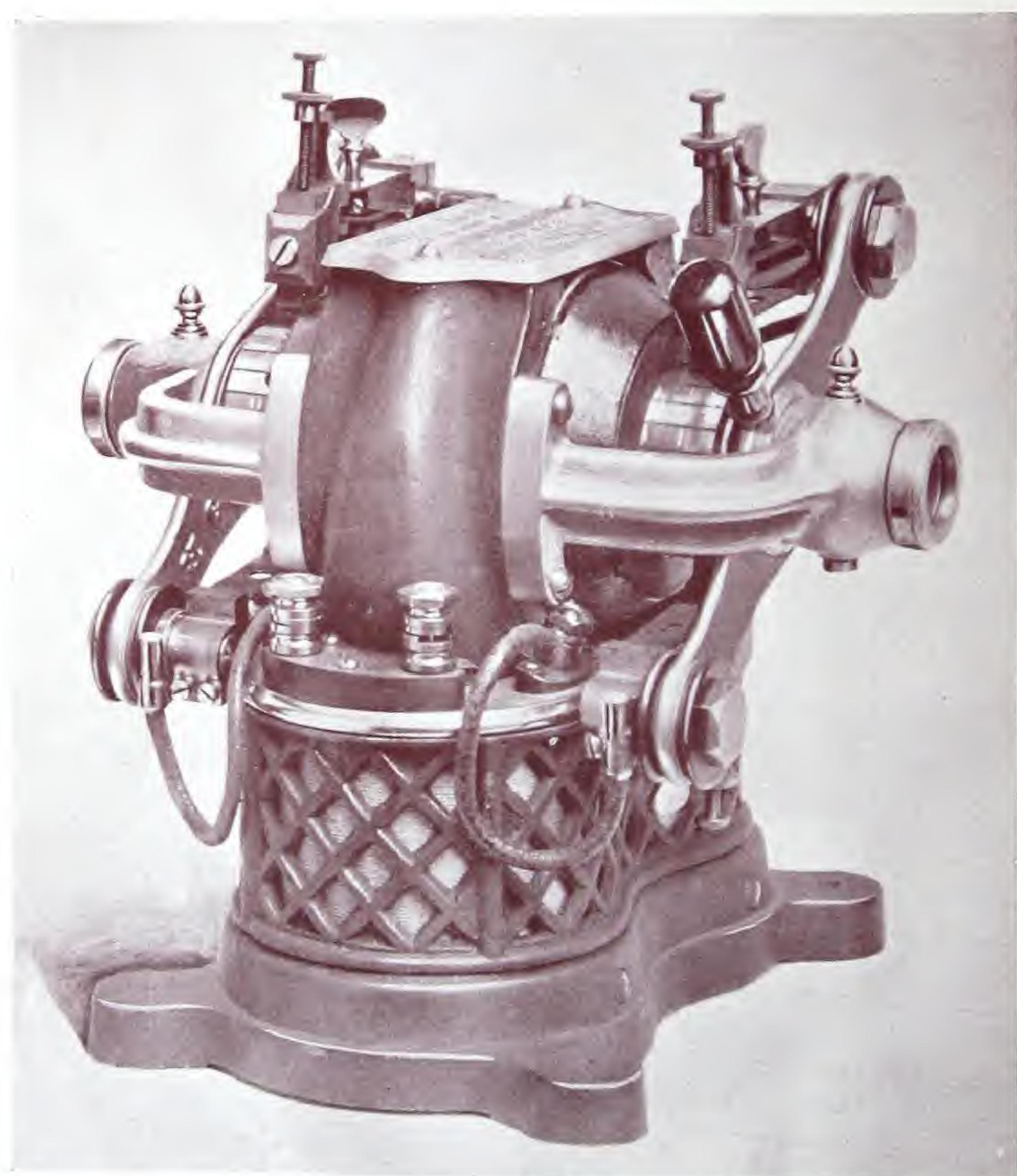
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CCA

M 3 Motor Generator.

Speed, 1000 Revolutions per Minute.



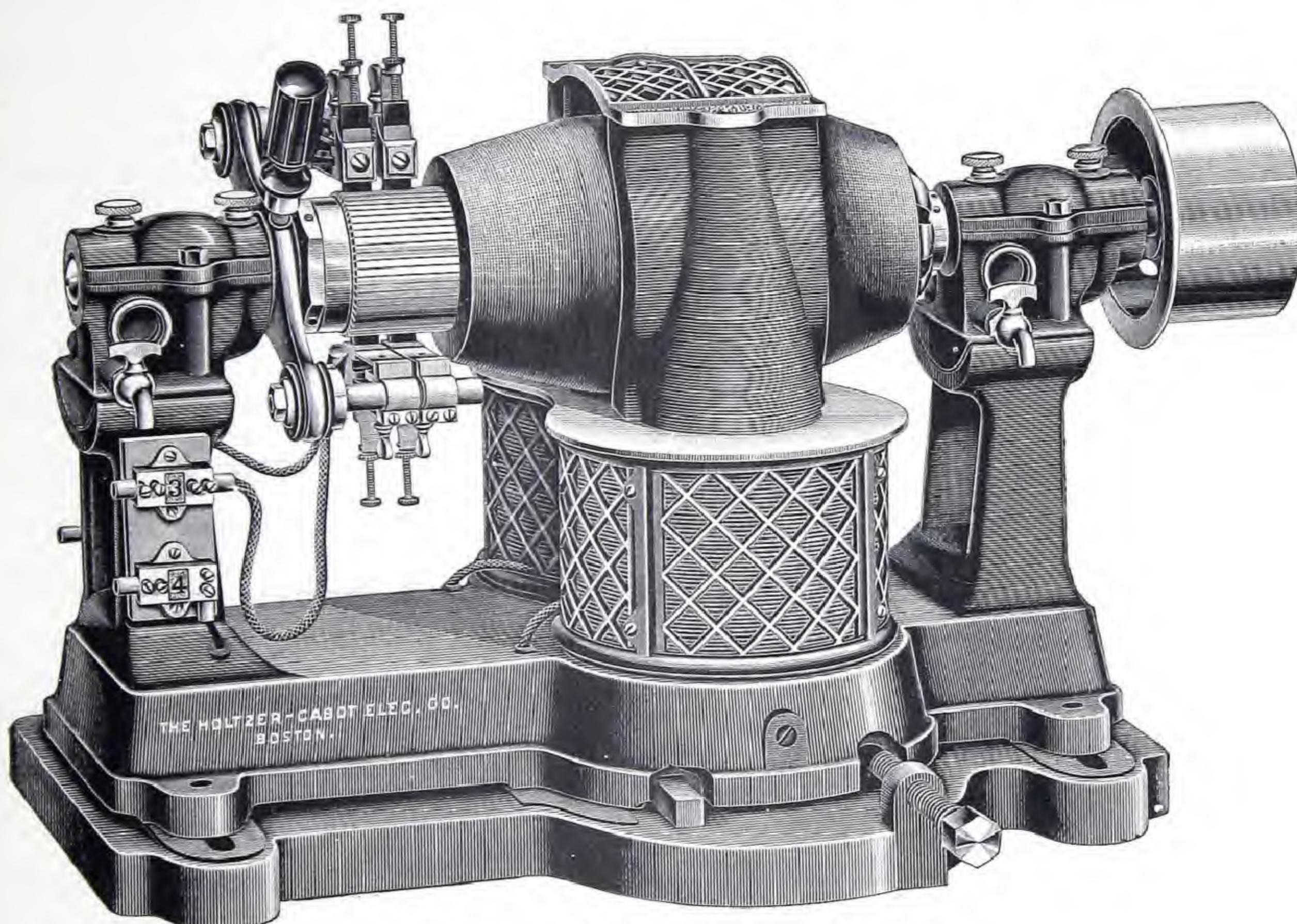
For Delivering Direct or Alternating Currents.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Holtzer-Cabot Power Motors and Dynamos.

We desire to call attention to the following salient points in Electrical and Mechanical design which are characteristic of **The Holtzer-Cabot Motors and Dynamos.**



2 H.-P. MOTOR TYPE D 2, D F.

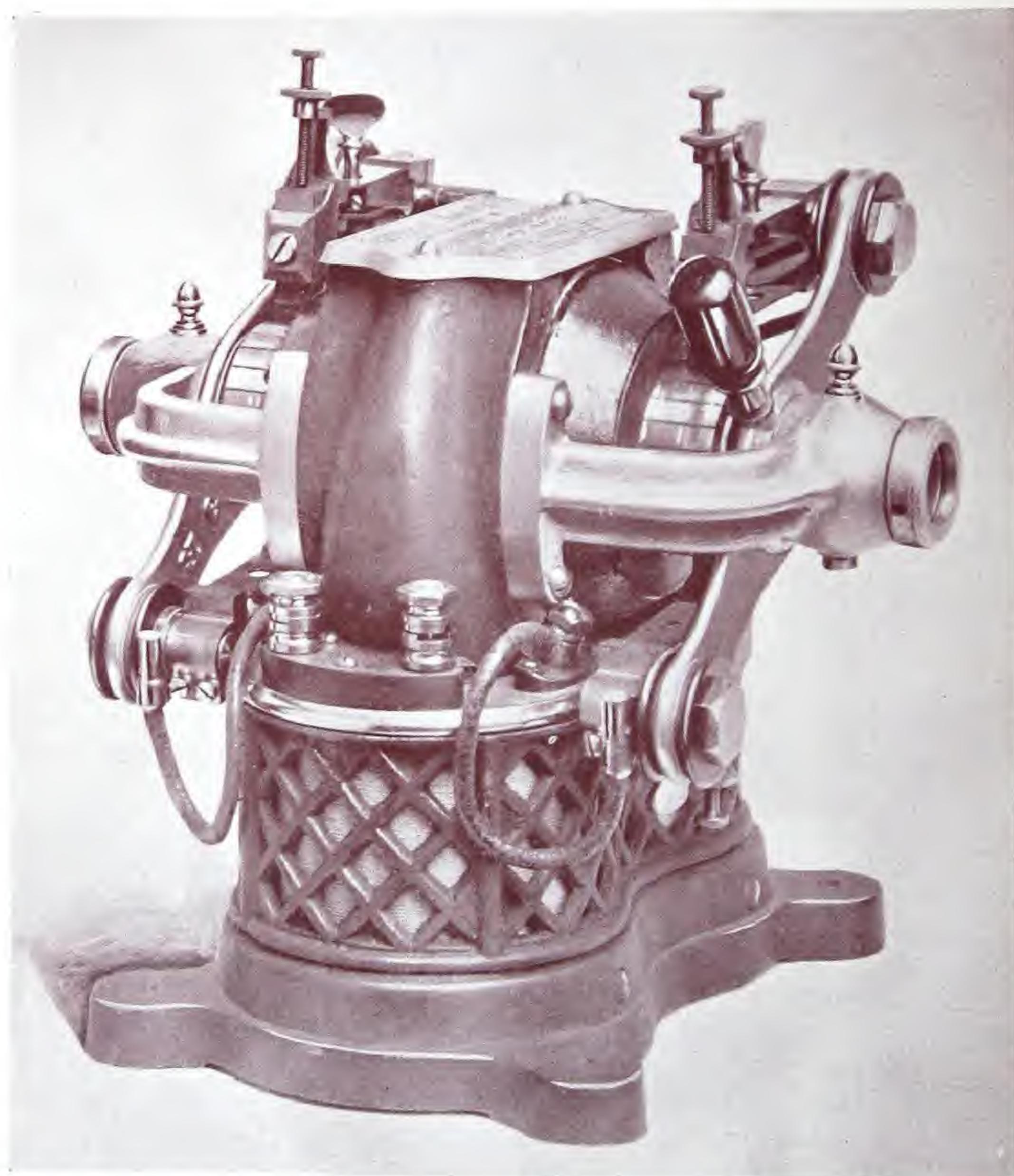
ELECTRICAL DETAILS OF THE HOLTZER-CABOT MOTORS.

THE REGULATION of our machine is automatic and perfect, giving a practically constant speed under wide variations of load. This is accomplished through the superior quality of the field core, which is made of the best soft steel, and the careful proportioning of the field and armature windings. The low current density and resistance of the latter, together with the square cross section of the armature reduces the heat loss to a minimum and brings about the desired result, constant speed under all loads.

THE SPEED. For bi-polar machines it will be seen that the speed is very low, as low as is consistent with moderate weight, high efficiency and low cost, and an average speed in the various sizes has been adopted that will fill most completely the above requirements.

M 3 Motor Generator.

Speed, 1000 Revolutions per Minute.



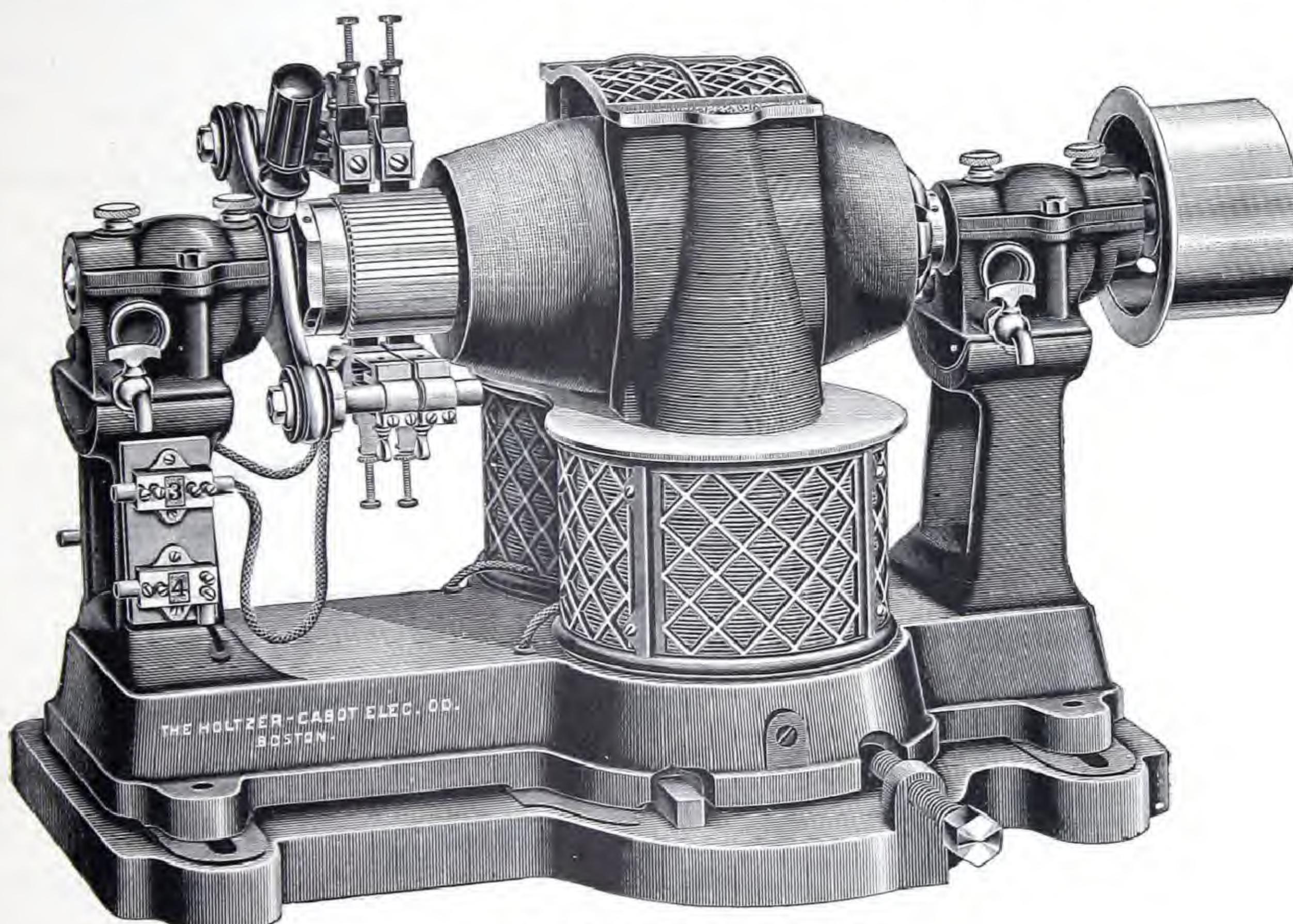
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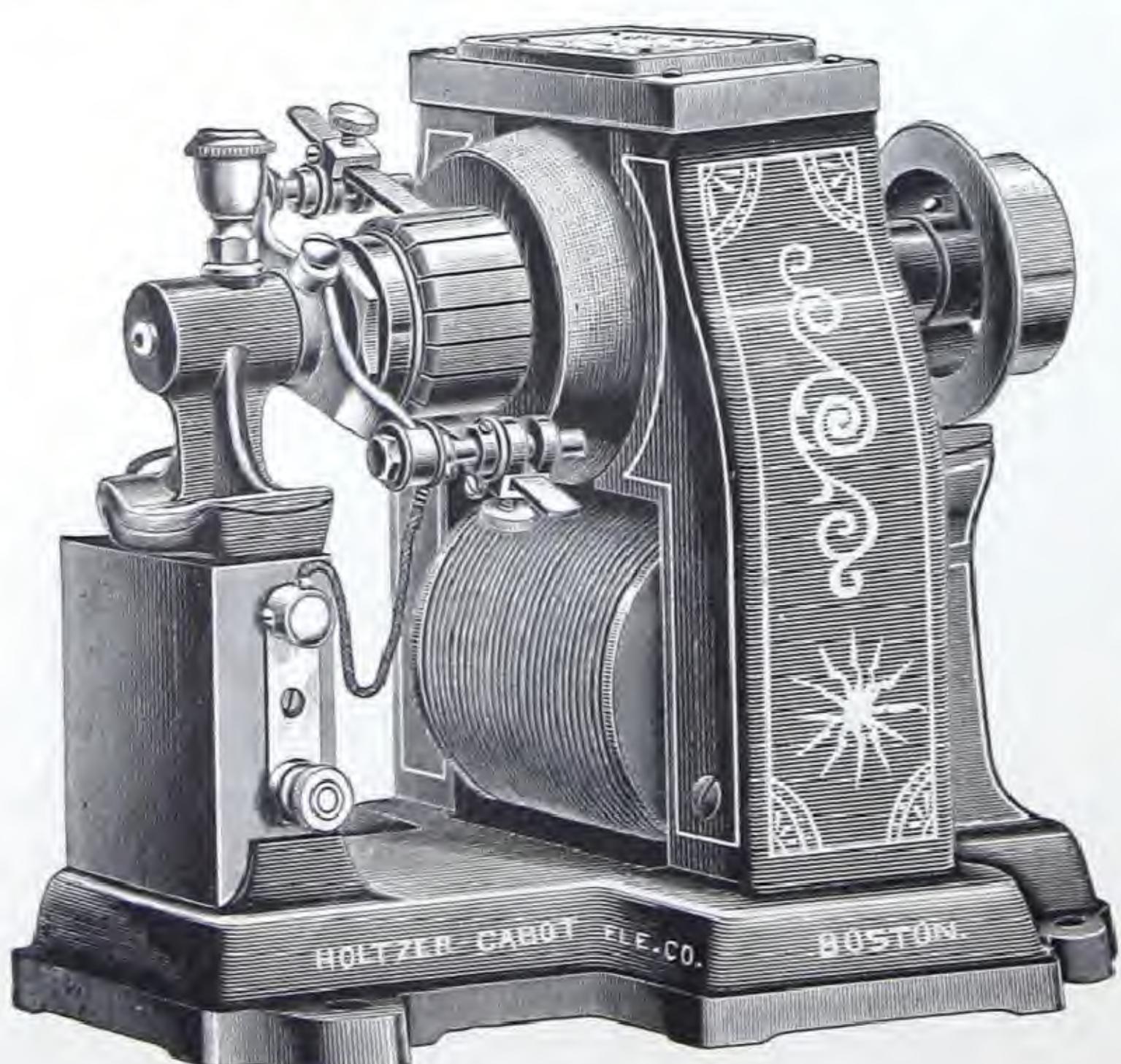
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

EFFICIENCY. A machine having the electrical details and magnetic circuit built on the above plan must necessarily show the highest efficiency, and this has always been a most prominent feature of the Holtzer-Cabot Motors. Tests made on a 1 H.P. Motor gave an efficiency of over 80 per cent., a result which is unapproached by any motor on the market of equal size. With our improved methods of manufacture, and the use of the best material, these Motors in the smaller sizes, reach even a higher degree of efficiency than the above mentioned test, while in the larger sizes it is over 92 per cent.

THE INSULATION. However high the efficiency of a Dynamo or Motor may be, and however perfect the regulation, if the insulation of Field, Armature, Commutator and Terminals is defective in quality, the machine is useless, and just here is where the knowledge acquired by an extended experience in the manufacture of Direct and Alternating Current machinery is needed. All our Motors and Dynamos, from 110 volts up, have the highest insulation that care and experience can suggest. Neither paper nor muslin is relied upon but the best mica is used in Armature and Field, as well as in the Commutator, and all are tested

for insulation by applying a pressure of 2000 to 3000 volts on all parts subject to stress.



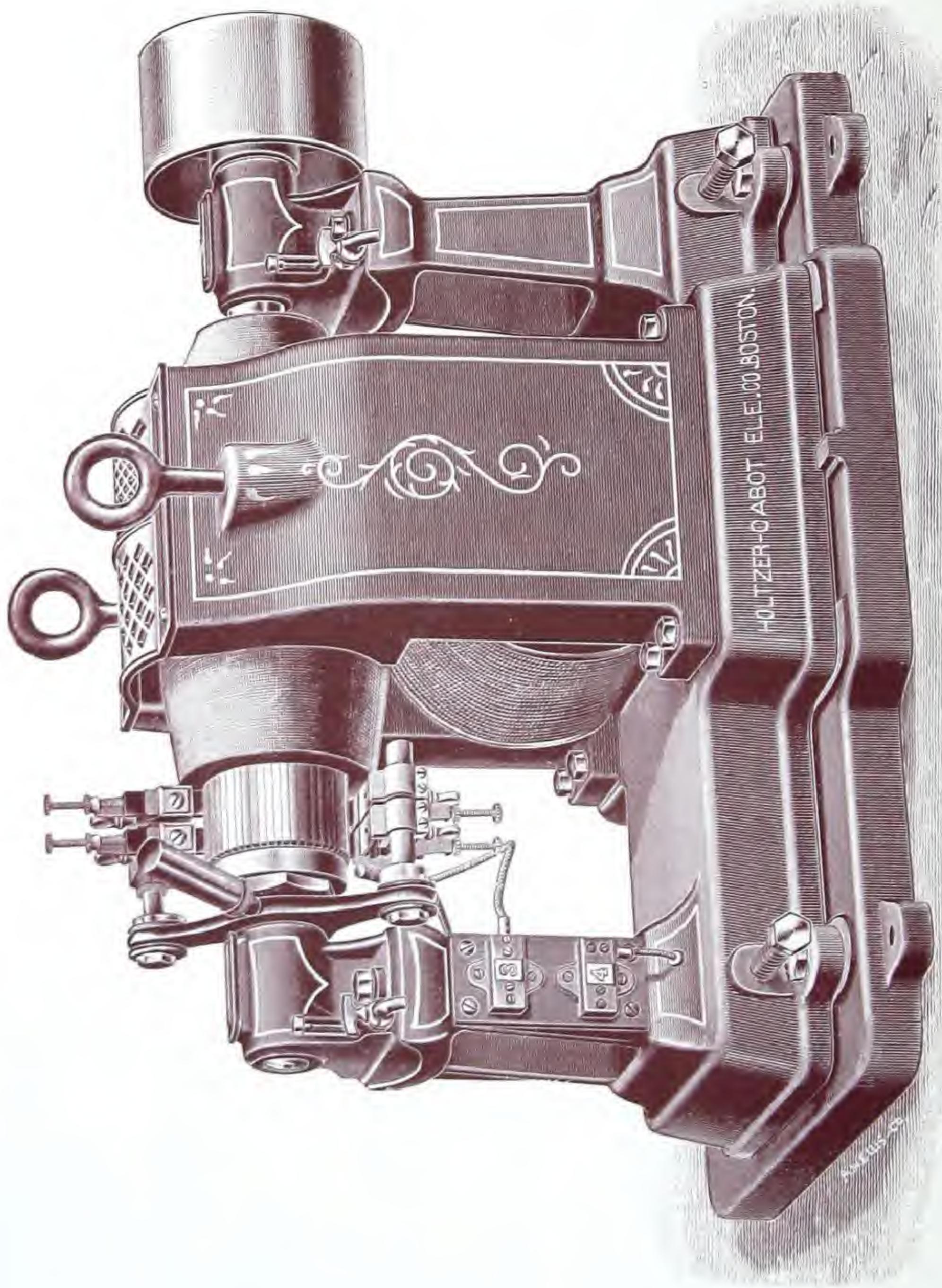
1-4 H.P., H.C. MOTOR.

TRUE EFFICIENCY. In arriving at the true commercial efficiency of a Motor or Dynamo, not only the efficiency of operation must be considered but the life or durability of the machine must be taken into account, and this last feature depends largely on the care with which the mechanical details have been worked out.

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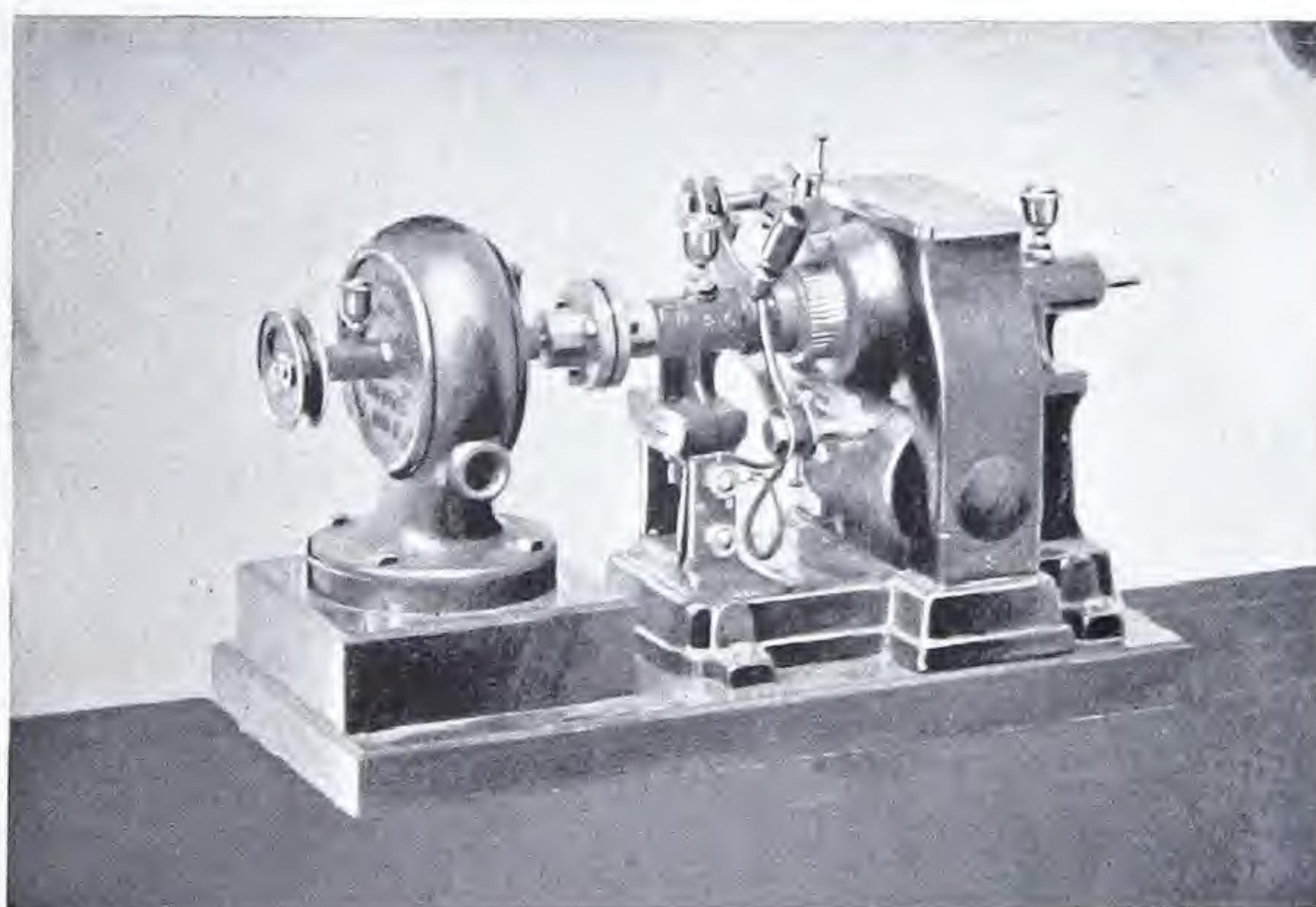
D 4 Constant Speed Motor.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

MECHANICAL DETAILS.

REFERRING to the cut of our "D 2" Machine (opp. page), it will be seen that the Machine is neat in design, and the distribution of metal in frame is such as to secure the greatest mechanical durability combined with good electrical design. The centre of gravity is low; self-oiling and self-aligning bearings with interchangeable sleeves of best phosphor-bronze are used; large sight gauge and oil cocks are provided, and as the bearings are unusually long, the machine will run for years without replacing sleeves, but when a change becomes necessary, a few minutes only are required. The shaft is of the best crucible steel, ground and polished to gauge at bearings, the armature is perfectly balanced and the Motor runs noiselessly. The field spools are removable and can be easily changed in case of an accident. The brush holder is of a new and very popular design and will collect more current with less heating than any other type of carbon brush manufactured. (See page 9 for further description of brush holder.)



M 3. H.-C. DYNAMO, DRIVEN BY WATER MOTOR.

A strong and neat iron sub-base is sent out with each machine of 2 H. P. and upwards. It is planed true, and fitted with belt tightener and clamping bolts. All parts are made to standard gauge and are interchangeable.

STANDARD DIRECT CURRENT GENERATORS.

The standard pressure for lighting purposes is 110 volts, but any other voltage will be wound to order. The small sizes are carefully built and are as complete in every essential detail as the larger machines. Small Dynamos are coming into use for operating telegraph, telephone and fire alarm systems, and also for charging storage batteries. On sizes from one kilowatt upwards, compound winding is used so as to keep the pressure constant at all loads, and unless otherwise ordered such generators are slightly overcompounded so that the E. M. F. or pressure will increase about 3 per cent. from no load to full load, to compensate for loss in external circuits. If required for charging storage batteries, they should be ordered shunt wound.

Starting Boxes and Rheostats.

Fig. 1.



SPEED REGULATING RHEOSTAT.

Fig. 2.



FIELD RHEOSTAT.

WE illustrate above our Motor Speed Regulator, and Field Rheostat, both of which are absolutely fire-proof, being constructed entirely of bare iron and copper wire with slate top and back and latticed iron-work casing.

All our Motors, of whatever size and voltage from 1 H. P. upward are provided with a Starting Box or Rheostat with Automatic Throw-Off, shown on opposite page. This box is of an entirely new type and from its extreme simplicity and durability is far superior to the spring and latch devices heretofore used. In this box, the lever, after having been turned to the "On" position by hand, is **automatically** held there by an electro-magnet. Should the supply of current be shut off for any cause, the lever will instantly fly back to the "Off" position, ready for starting. On railway circuits this is a valuable feature, as it frequently happens Motors are damaged through the circuit breaker at the station opening and closing again before the attendant could reach the Motor and throw off the switch.

Fig. 1 shows our Speed Regulator which we supply with Motors in cases where variable speed is called for; we also manufacture a combined Reversing Switch and Rheostat.

Rheostat, with Automatic Throw-Off.



Supplied with all Motors above 1-2 H -P.

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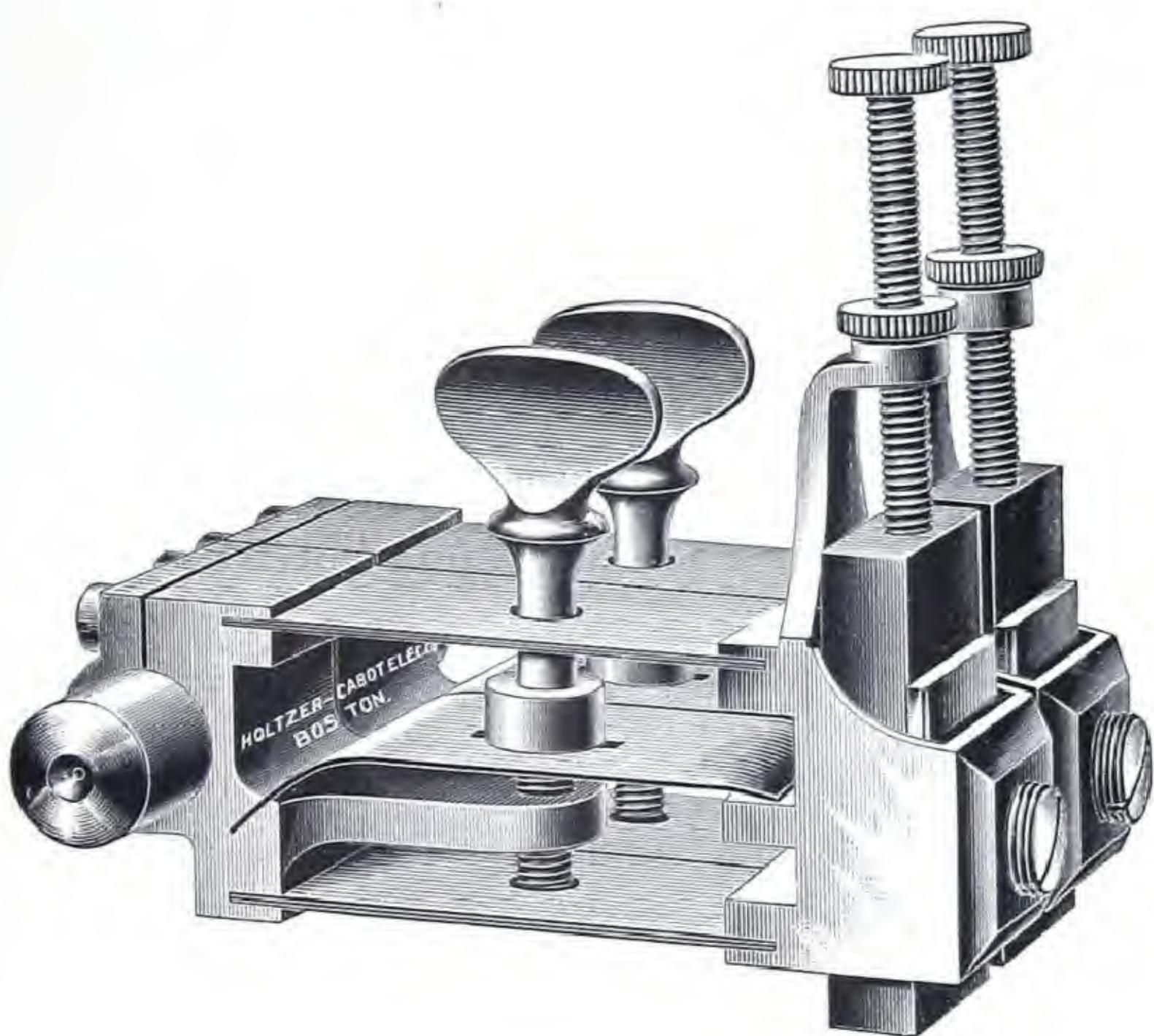
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Parallel Feed Brush Holder

USED ON

H.-C. MOTORS AND DYNAMOS.

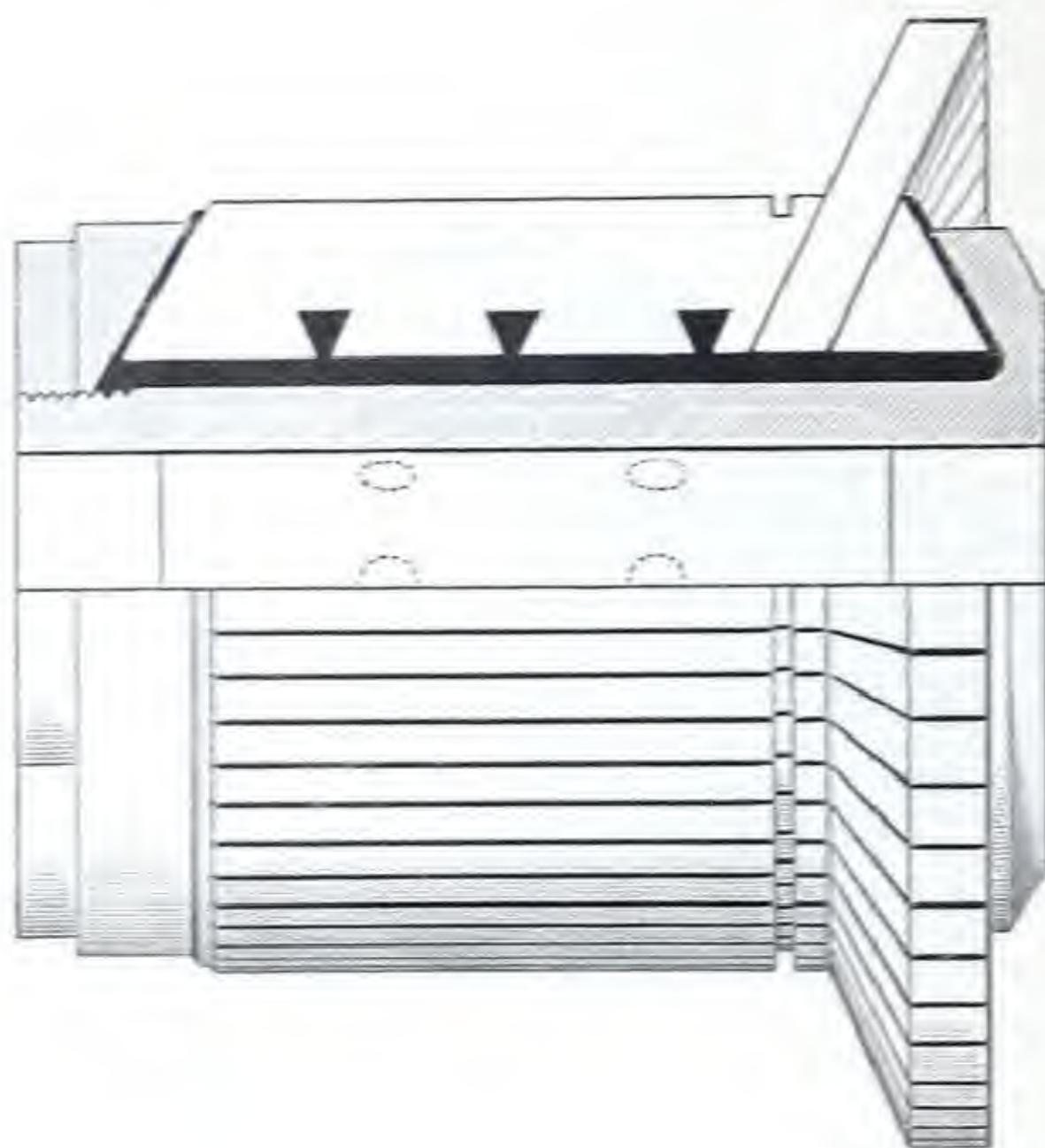


DESCRIPTION.

THE special features of merit obtained in this Brush Holder, briefly stated, are these: Being clamped rigidly in the holder, its whole surface is always in perfect contact with the commutator; the angle of contact does not change as the brush wears away; as there are no working joints between its component parts, its construction is unusually light, and good contact is maintained with an irregular commutator or one worn to a considerable degree; the absence of such joints between the brush holder and stud eliminates friction; squeaking, usually resulting in the ordinary holder from vibration of the brush, is entirely obviated; all necessary motion is imparted to the brush through the elasticity of the spring. The holder is light, and its tension is capable of perfect adjustment, and heating of the holder from imperfect contact with the brush is an impossibility.

H.-C. Commutator.

SHOWING METHOD OF CONSTRUCTION AND INSULATION.



ONE of the strongest features of the H.-C. Motors and Dynamos is the excellence of design and workmanship shown in the commutator, and we have much pleasure in calling attention to a still further improvement in this important feature, which renders it, in point of durability, perfection of insulation, and mechanical excellence, superior to anything of the kind yet presented. The cut shows the massive, hard-drawn copper segments insulated from the ends of spool by heavy mica rings or washers, and the space between the core of spool and segments is completely filled with a special indestructible insulating compound, which is forced into this space under heavy pressure and high temperature; the result being that under all conditions this insulation remains extremely hard and tenacious, and the commutator, as a whole, is practically one solid structure. The perfection of insulation and durability has been reached in this design, and the defects inherent to commutators, as usually constructed, have been completely eliminated.

Data and Prices of H.-C. Direct Current Generators.

Class.	Output Kilowatts	Output Amperes	Current at 60 W ^o es.	Speed of Armature Rev. per min.	Size of Pulley, 1/8 in. diameter	Ball Speed per min.	Weight on Armature	Dynamo Complete (See note)	Frame Field Rheostat.
M 00	1 $\frac{1}{2}$	1	2,000	1 $\frac{1}{2}$ 000	—	—	4	\$35.00	\$15.00
M 2	3 $\frac{1}{2}$	2	—	—	1,152	—	8	85.00	37.50
M 3	1 $\frac{1}{2}$	3 $\frac{1}{2}$	—	—	1,750	17 $\frac{1}{2}$	120.00	49.50	17.50
M 4	3 $\frac{1}{2}$	6	12	1,900	4	—	24	135.00	62.00
D 2	2	18	31	1,500	6	—	57	215.00	84.00
D 3	3	27	47	1,500	5	—	78	295.00	110.00
D 4	4	36	63	1,500	7	—	100	310.00	130.00
D 5	5	45	78	1,400	7	—	120	300.00	150.00
D 6	6	53	93	1,350	8	—	135	120.00	160.00
D 7 $\frac{1}{2}$	7 $\frac{1}{2}$	68	117	1,350	9	—	150	180.00	170.00
D 10	10	90	150	1,150	10	—	3,011	185.00	200.00
D 15	15	135	234	950	12	—	3,500	275	255.00
D 20	20	180	312	750	13 $\frac{1}{2}$	—	2,777	360	300.00
D 25	25	225	400	850	13 $\frac{1}{2}$	—	2,842	380	350.00

DYNAMO COMPLETE.—With M 2 and larger sizes are included free-proof field rheostat. With D 2 and larger sizes are included sub base and belt-tightening gear. Rails for M 3 and M 4, \$20.00 extra.

DYNAMO COMPLETE.—With M 2 and larger sizes are included free-proof field rheostat. With D 2 and larger sizes are included sub base and belt-tightening gear. Rails for M 3 and M 4, \$20.00 extra.

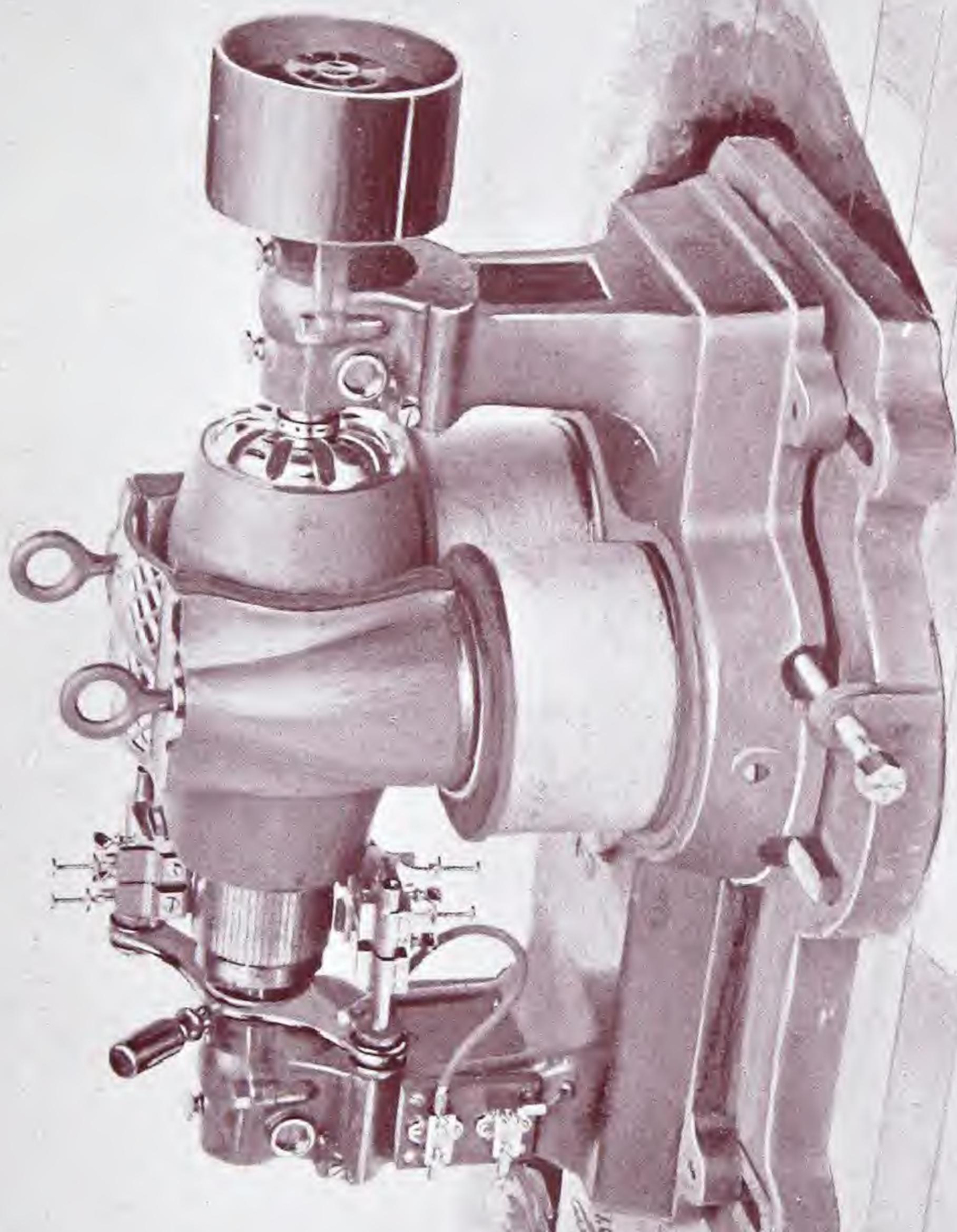
Data and Prices, Standard H.-C. Motors.

CLASS,	H. P. at Rated Voltage,	Standard Voltage,	Armature Rev. per min.	Size of Poles, P. F.P. (A.V.)	Diameter, Inches,	Force, Inches,	Weight of Armature.	Main Complete, (See note.)	Armature, (See note.)	Prices.	
										Fire-proof Starting Box, Automatic Throw-off,	Fire-proof Speed Regulator, Auto. Throw-off
M 00	1/6	4-110	1,000-2,000	1 1/2	—	—	—	\$35.00	\$15.00	—	To order only
M 2	1/4	110-220	1,700	2	1 1/2	8	75.00	37.50	\$30.00	\$35.00	35.00
M 2	1/4	500	1,700	2	1 1/2	8	85.00	42.50	30.00	45.00	50.00
M 3	1/6	110-220	1,500	3	2	17 1/2	110.00	49.50	45.00	50.00	60.00
M 3	1/6	500	1,500	3	2	17 1/2	120.00	54.00	45.00	50.00	60.00
M 4	1	110-220	1,700	4	3	26	155.00	62.00	45.00	60.00	60.00
M 4	1	600	1,700	4	3	26	165.00	66.00	45.00	60.00	60.00
D 2	2	220-500	1,450	5	3	56	215.00	84.00	45.00	60.00	60.00
D 3	3	220-500	1,450	5	3	78	265.00	100.00	45.00	—	—
D 4	4	220-500	1,200	6	4	100	310.00	130.00	45.00	—	—
D 5	5	220-500	1,200	7	4	120	360.00	150.00	50.00	—	—
D 6	6	220-500	1,300	7	4	135	420.00	160.00	45.00	—	—
D 7 1/2	7 1/2	220-500	1,300	8	5	150	480.00	170.00	50.00	—	—
D 10	10	220-600	1,150	10	6	185 1/2	600.00	200.00	55.00	—	—
D 15	15	220-500	1,050	11	6	275	800.00	255.00	70.00	—	—
D 20	20	220-500	950	13 1/2	8	360	1,000.00	300.00	70.00	—	—
D 25	25	220-500	800	13 1/2	8	380	1,200.00	350.00	70.00	—	—

Fire-proof Starting Boxes.—With automatic throw-off are included in price for motors from 1 H.P. upward. Sub-base and belt-tightening gear from 2 H.P. upward. Belt-tightening gear and rails for $\frac{1}{2}$ and 1 H.P. to order at \$20.00 extra. Speed regulating boxes to order only, and when wanted deduct price of regular automatic box from price list motor complete and add price of Speed Regulator.

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.



D 5 Compound Wound Dynamo.

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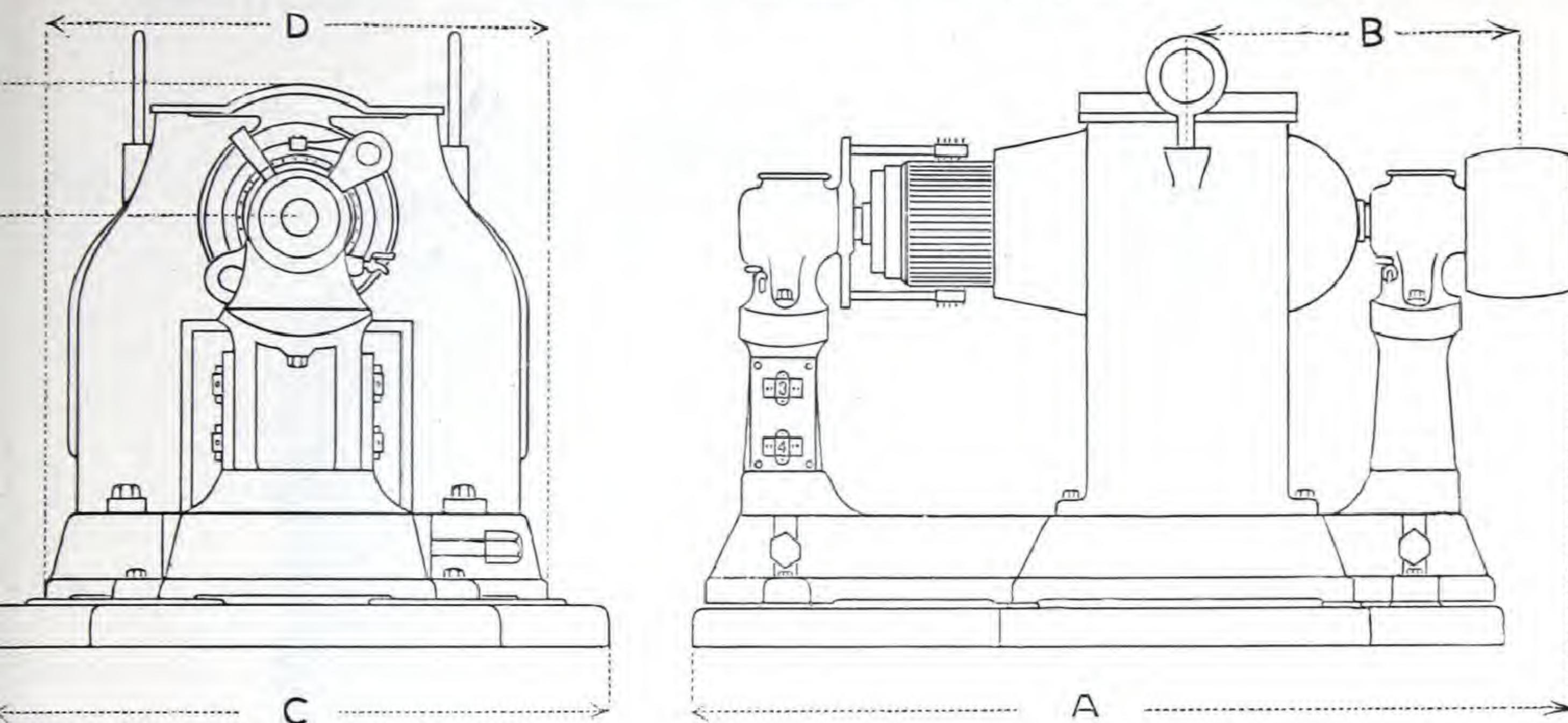


CCA

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Diagram to be used with Table of Dimensions and Weights given below.



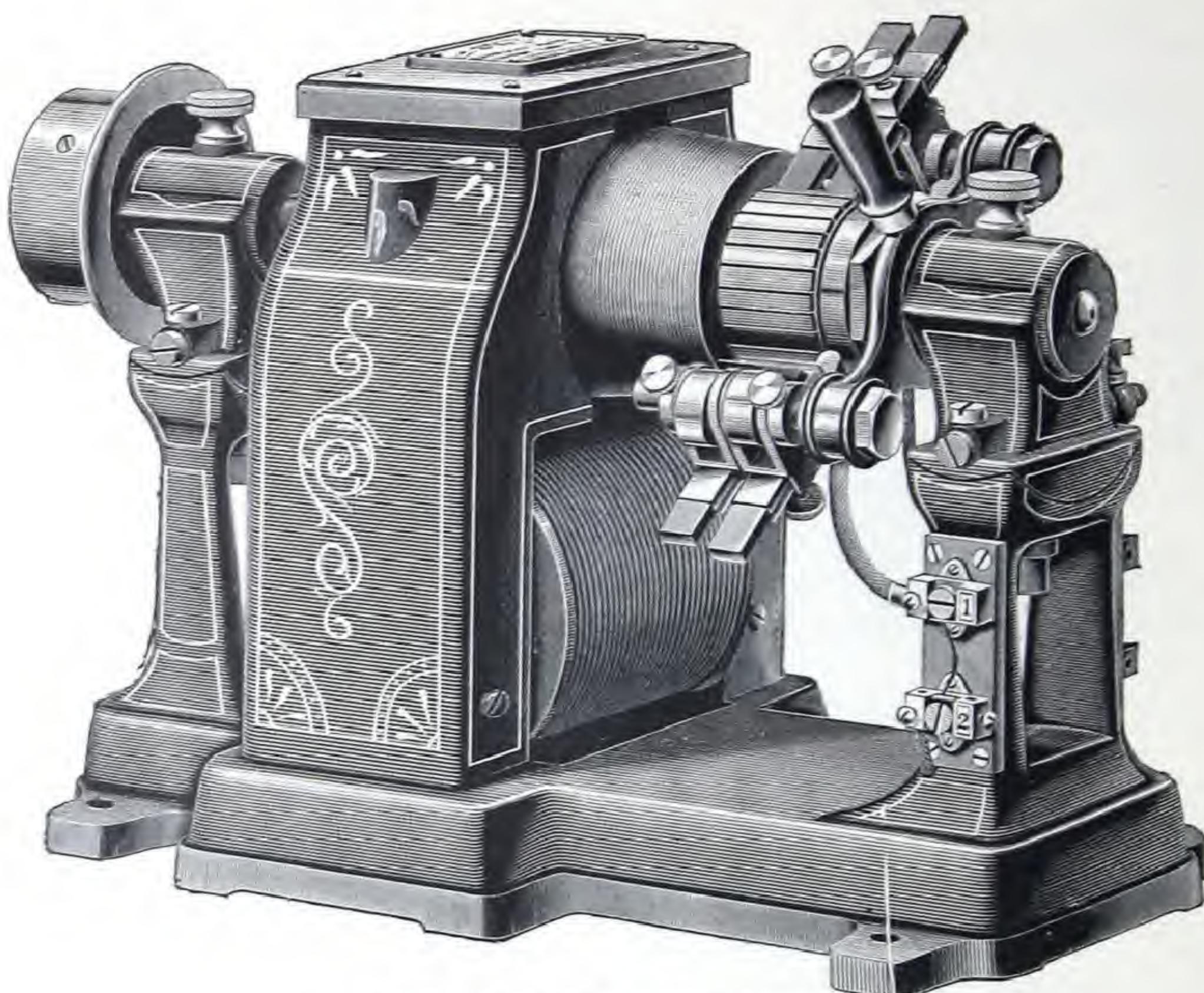
DIMENSIONS AND WEIGHTS OF STANDARD HOLTZER-CABOT
MOTORS AND DYNAMOS.

CLASS.	WEIGHT.	Approximate weight boxed for shipment with rheostat subbase.	PULLEY.		A	B	C	D	E	F		
			Inch	1½	Grooved.	Inch.	3¼	Inch.	...	Inch.	6¾	Inch.
M 00	18 lbs.	25 lbs.				8	3¼			7	6¾	9
M 1	29 "	40 "		2	"	9¼	4			5¾	6½	8¼
V 2	39 "	50 "		15	Fan.	7	5¼			9¾	7½	10½
M 2	32 "	67 "		2	1½ in.	13¾	5½			9	7¾	10½
M 3	95 "	125 "		3	2 "	16½	6¾			11½	9½	13
M 4	160 "	200 "		4	2 "	22	9			11½	10½	13¾
D 2	350 "	400 "		5	3 "	29	12½	21½	16¾	13¼	16	
D 3	390 "	500 "		5	3 "	30¼	13	23	17½	14¾	19	
D 5	600 "	750 "		7	4 "	36	15	25	20	15½	20	
D 7½	950 "	1100 "		9	6 "	40	17	28	22	18½	23½	
D 10	1100 "	1400 "		10	6 "	45	18½	30½	24	21	26¼	
D 15	1800 "	2100 "		11	7 "	50½	20¾	32	26¼	22½	28½	
D 20	2200 "	2500 "		12	8 "	51½	21¼	32	26¼	25	31½	

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Electro-Plating and Depositing Machines.



M 4. PLATING GENERATOR.

THESE Machines are the result of many careful tests in actual factory practice, and will be found to safely perform much more work than is scheduled. They are made self-exciting, with variable field for various loads. They can also be had with fields to be separately excited from other dynamos or street service, giving absolute control over rate of deposition without usual wasteful resistances.

PRICE LIST.

CLASS.	SILVER PER HOUR.	NICKEL.	H.-P. REQUIRED AT FULL LOAD.	PULLEY.	SPEED APPROXIMATE.	PRICE.
M 00	2 oz.	36 gall.	1-5	1½ in. x 1¼	2,500	\$40.00
M 1	3 "	50 "	1-4	2 " x 1¼	2,200	50.00
M 2	6 "	100 "	1-3	2 " x 1½	2,000	95.00
M 3	12 "	200 "	3-5	3 " x 2	1,750	140.00
M 4	25 "	400 "	1	4 " x 2	1,900	190.00
D 2	53 "	825 "	2	5 " x 3	1,750	250.00
D 4	110 "	1,700 "	4	7 " x 4	1,600	390.00
D 5	140 "	2,150 "	5	8 " x 5	1,400	425.00
D 7½		3,500 "	7½	8 " x 5	1,300	700.00

For dimensions, weights, etc., see table on page 13.

With D 2 and larger sizes are sent Sub-base, Sliding Rails and belt-tightening gear. Rails and gear for M 3 and M 4, \$20.00 extra.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

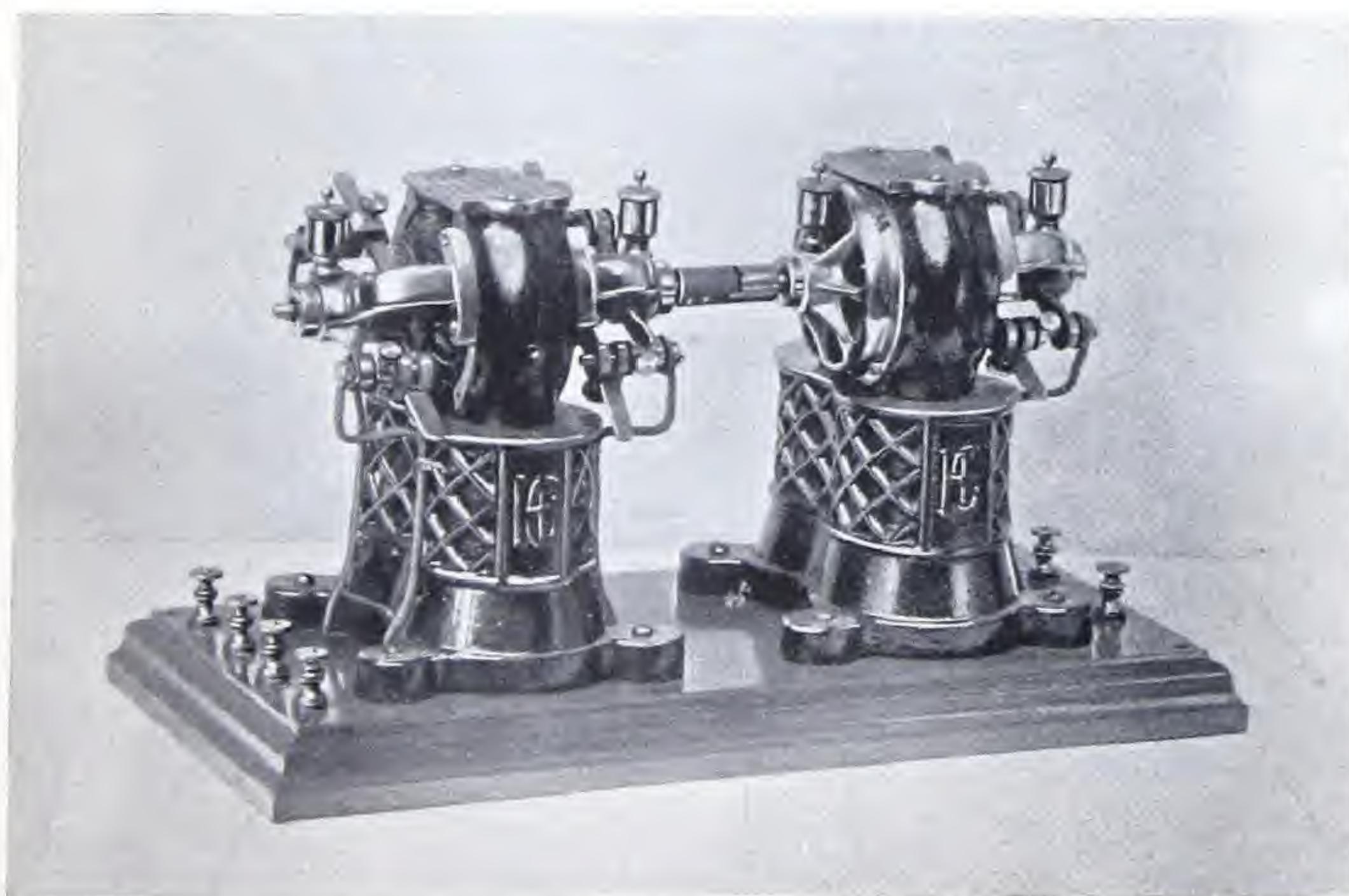
Motor Generators

FOR DIRECT AND ALTERNATING CURRENTS.

MOTOR Generators are displacing primary batteries for many purposes, including Telegraph, Telephone, Fire Alarm Circuits, Plating, and Charging Storage Cells from high tension circuits. With the introduction of these compact and powerful machines, the trouble and constant care inevitable where batteries are used has disappeared, and also the expensive renewals of Zines, Chemicals, &c., common to all cells.

The H.-C. Motor Generator is now in use in many telephone exchanges, and on a number of fire alarm systems throughout the country, and the success of our machines is largely due to the smooth running, slow speed and careful construction of Armature and Bearings.

Our Motor Generators are now in use on fire alarm circuits which were started three years ago, and have been running night and day without any repairs, needing only occasional attention, such as filling up grease cups and cleaning.



We have recently designed a special type of Motor Generator, shown above, for medical purposes. It will be seen that the Motor is insulated from, and electrically separate from the Generator, and connected thereto by an insulated coupling. The objection sometimes made by physicians to this class of apparatus here, does not apply to our Machine in that it is impossible for the Motor on high voltage circuits to become crossed or grounded with the Generator or operating circuit.

FOR PRICES SEE PAGE 17.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

THESE Machines may be so arranged as to operate on direct current circuits of 110 to 500 volts, and on alternating circuit from 52 to 110 volts, while the Generator will be wound to give any desired current and voltage. One pair of terminals may be connected to the 75 or 100 volt winding and used for electrolysis, and another pair of terminals connected to a low pressure winding of, say, 10 volts will give a current up to 10 or 15 amperes, suitable for operating Induction Coils, medical lamps and cauteries, and for all Therapeutic purposes for which primary galvanic cells are usually employed.



For this class of work where the alternating current alone can be obtained, we have also an adjustable transformer, shown above, in which there are no moving parts whatever, and from which an alternating current from one to 30 amperes and up to 20 volts may be obtained. This instrument is particularly suitable for hospital work where heavy currents are frequently used for cauterizing.

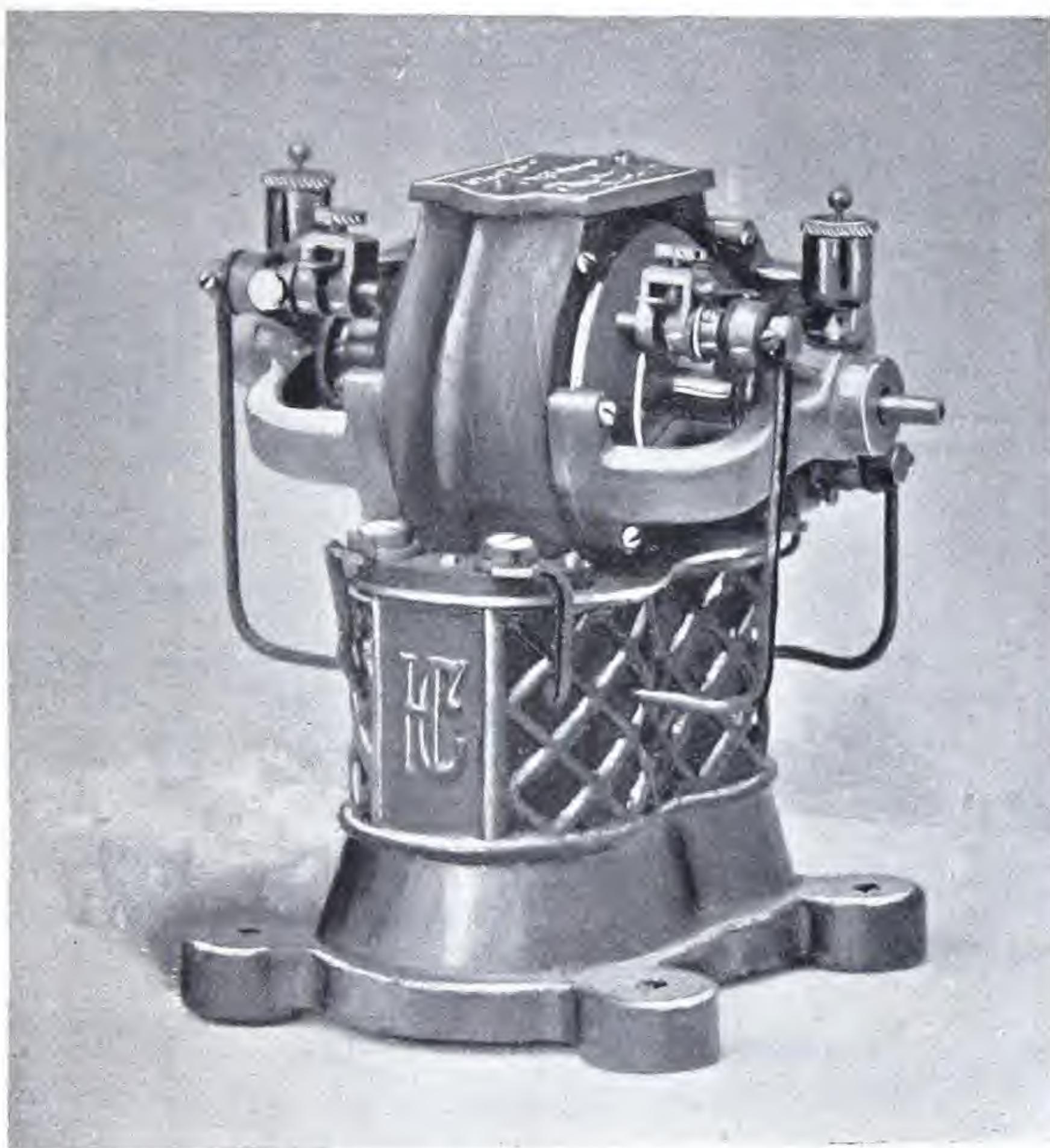
Price complete as illustrated above \$70.00

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Motor Generators.

(CONTINUED.)



CUT SHOWING M 00 MOTOR GENERATOR.

PRICE LIST.

TYPE.	CLASS.	Generator Capacity Watts.	VOLTAGE MOTOR.	VOLTAGE GENERATOR.	PRICE.
M 00	M. G. $\frac{1}{2}$	50	4-110	4-110	\$75.00
V 3	M. G. 2	170	4-110	4-110	145.00
V 3	M. G. 2	170	220-500	4-220	155.00
M 3	M. G. 3	200	110-500	4-220	170.00

Price of Machines larger than M 3 will be quoted on application.

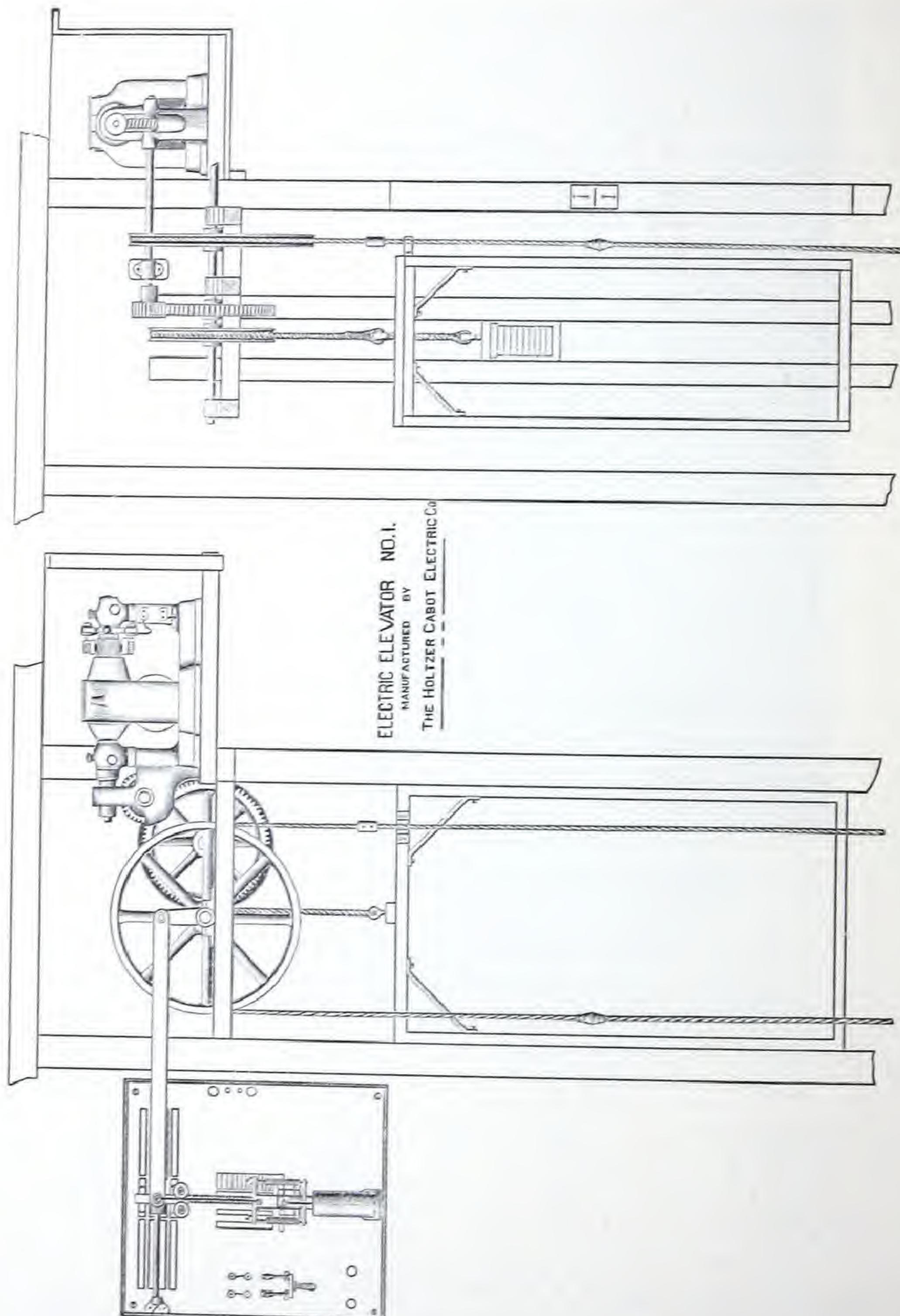
See also Motor Generator built for Boston Fire Department, and illustrated as frontispiece.

Boxing Charged at Cost.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Holtzer-Cabot Electric Elevator.



Estimates and Full Information on Application.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Alternating and Direct Current Power Motors

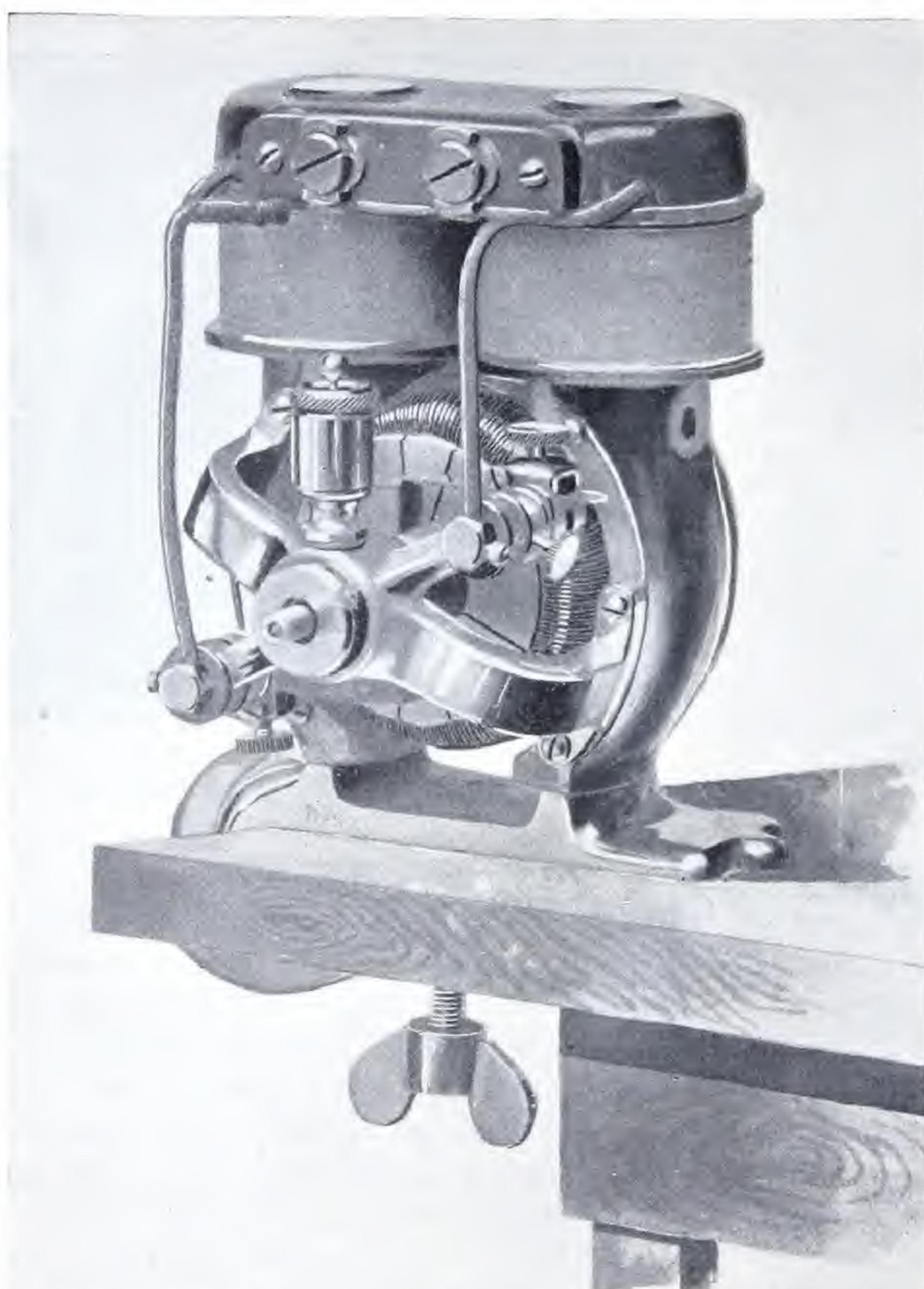
Efficient.

Noiseless.

Self-Lubricating.

Durable.

This Machine is well adapted for running small lathes, sewing machines and other light machinery. We also manufacture a $\frac{1}{8}$ H. P. alternating motor (similar to our A. C. F. machine) for this work, and guarantee both machines to be perfect in every respect. The A. C. clamp motor is constant speed machine.



1/8 H.P. DIRECT CURRENT M 00 CLAMP MOTOR, 110 to 220 Volts.

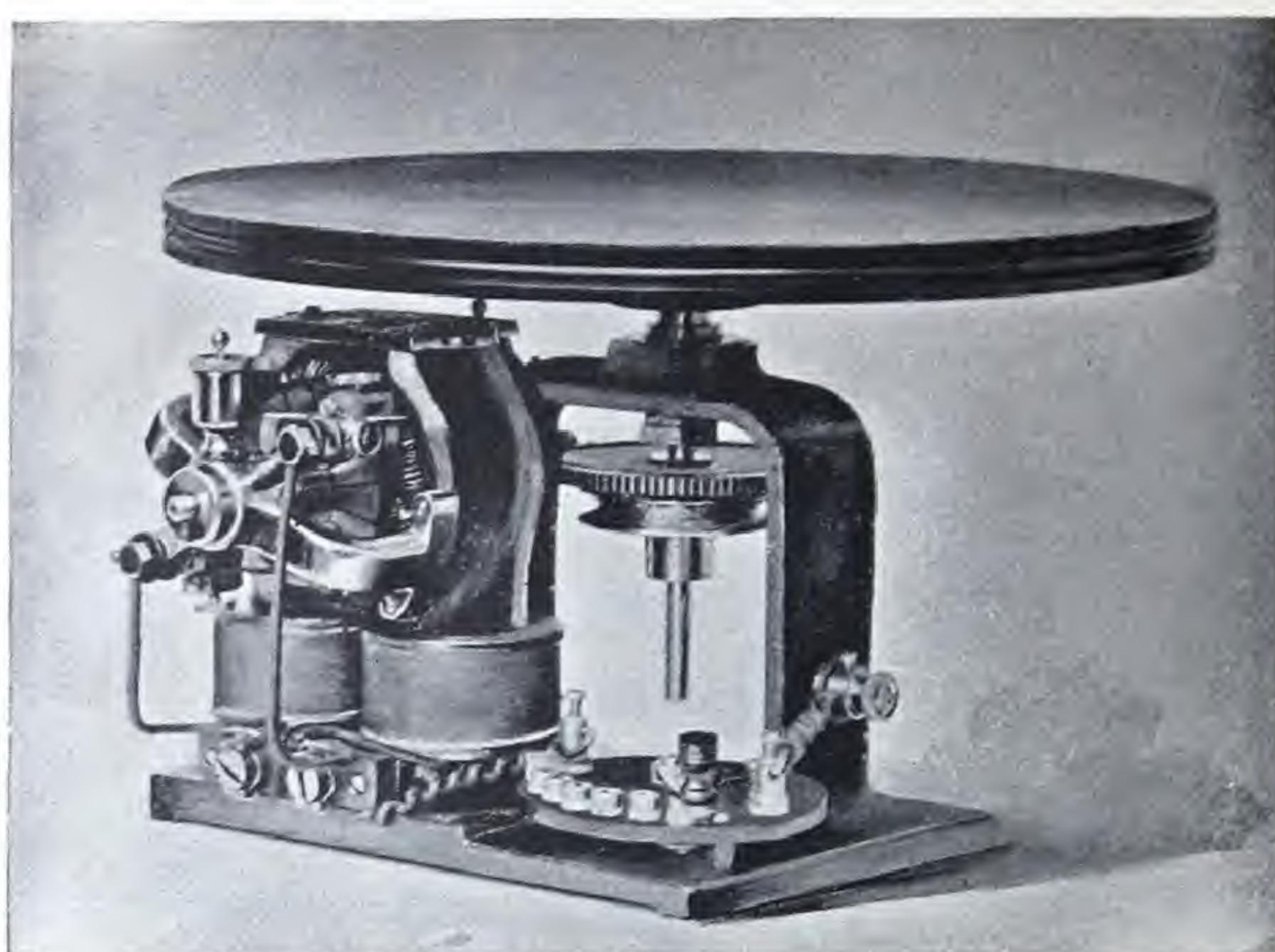
PRICE LIST.

1/8 H.P. M 00 Clamp Motor, variable speed, 4 to 10 volts	.. . . . .	\$24.00
1/8 " " " " " 110 "	.. . . . .	30.00
1/8 " " " " " 220 "	.. . . . .	35.00
1/8 " " " " constant speed, 110 "	.. . . . .	35.00
1/8 " " " " " 220 "	.. . . . .	42.00
A.C. Clamp Motor, constant speed, 52 to 104 "	.. . . . .	40.00
Speed Regulating Rheostat for 52 or 104 A.C. or 110 V. direct current,	.. . . . .	12.00
" " " " " 220 direct current, extra	.. . . . .	10.00
Special Rheostat for connecting to treadle of sewing machine for use with Clamp Motors	.. . . . .	15.00

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

H.-C. Window Turntable.



WINDOW TURNTABLE WITH M 00 1-8 H.P. MOTOR.

THIS Turntable is by far the most powerful and durable device of its kind on the market. As cut shows, it is substantial and compact in design. It is operated by our M 00 direct current, or A. C. I. Motor for alternating circuits as may be desired. The speed of table can be varied by means of a speed regulator, which we will furnish at an extra cost, see price list below. On the spindle of the table can be fitted an extra pulley to which other turntables may be belted, as the Motors are of sufficient power to operate 5 or 6 tables in addition to its own. The standard diameter of table is 14 in.; larger tables can be supplied at a slight extra cost. This apparatus will carry an approximate weight of 200 pounds.

PRICE LIST.

Turntable complete with M 00 Direct Current Motor 110 volts	.	.	.	.	.	.	\$60.00
" " " " " 220 "	.	.	.	.	.	.	70.00
" " " " " 500 "	.	.	.	.	.	.	80.00
" " " " " alternating current " 52 or 104 volts	.	.	.	.	.	.	70.00
Stand and Turntables only, for belting to above	.	.	.	.	.	.	15.00
Speed Rheostat, extra	.	.	.	.	.	.	20.00

When desired we can fit these Turntables with revolving lamps of various colors, giving splendid and attractive effects, and making a desirable window attraction. This will be charged extra, and prices will be given on application.

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CCA

DIRECT ^{AND} ALTERNATING
FAN MOTORS.

CABOT
HOTEL ELECTRIC CO.

BOSTON, MASS.

TRADE MARK
REGISTERED

7.10
1904



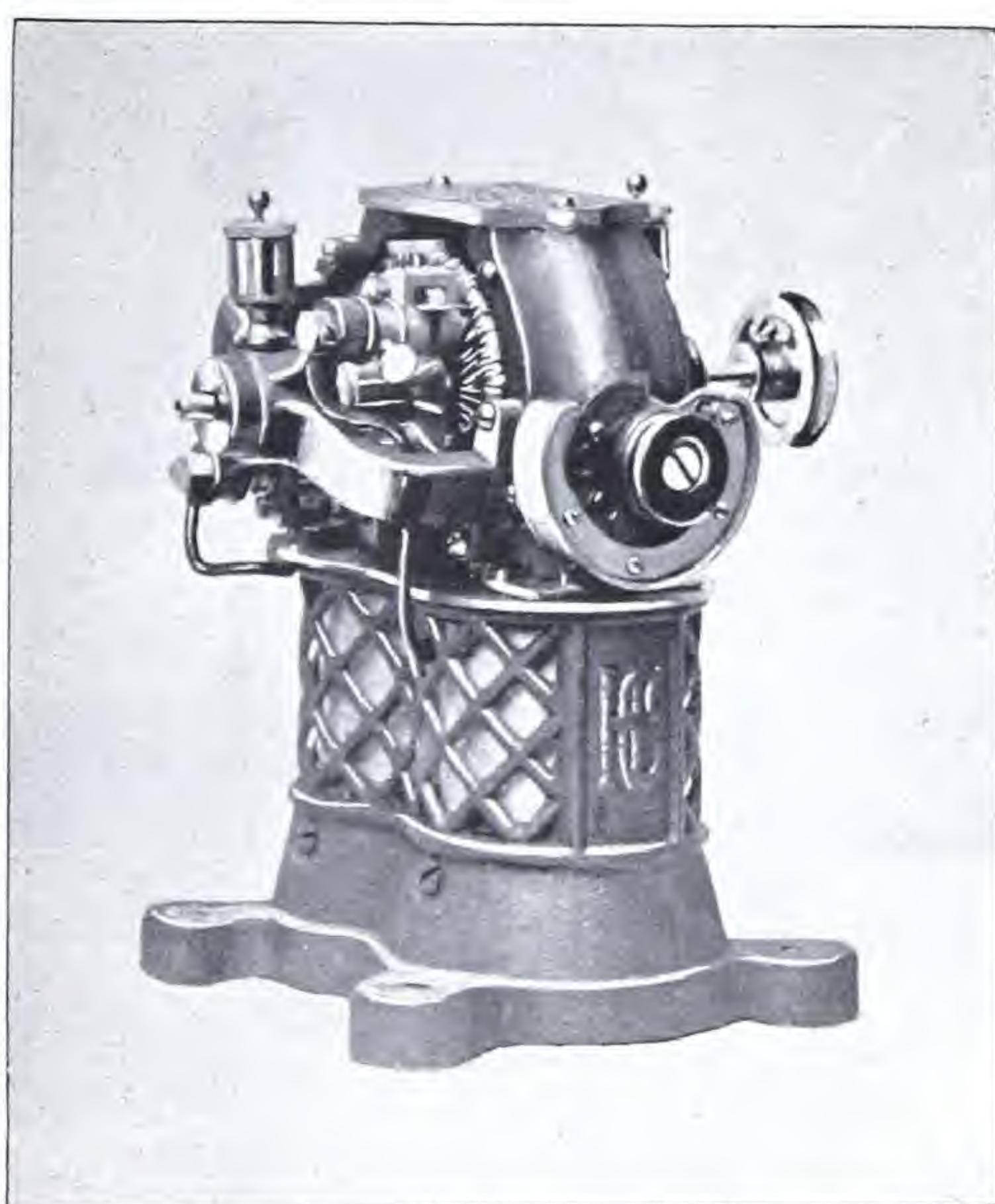
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Small Power Motors.

CONTINUED.)

DIRECT CURRENT 1-8 H. P. VARIABLE SPEED POWER MOTOR.



1-8 H. P. Class M 00, 110 to 500 Volts.

PRICE LIST.

1/8 H. P. C. S., 110 volts, Speed 1,700 to 2,200	.. . . . .	\$35.00
1/8 " " 220 " " 2,200	.. . . . .	42.00
1/8 " " 500 " " 2,200	.. . . . .	56.00

The remarks on previous page regarding Clamp Motors apply equally to the above, which are practically similar, except that the Motors are mounted on plain base instead of having clamp attachment.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Small Power Motors

(CONTINUED.)

FOR ALTERNATING CURRENT, 1-8 H. P.



HOLTZER-CABOT INDUCTION MOTOR.

DESCRIPTION.

HIS Machine is built for currents of high or low frequency, 52 or 104 volts, and is of the induction model, having no commutator nor brushes. It is self-starting and non-synchronous, its speed being 2000 rev. per minute, and is maintained practically constant under all loads.

It is an efficient machine and is thoroughly built; its shaft being of Stubbs steel and its bearing of phosphor bronze.

Its height is 8 inches, thickness 3 inches, and weight 20 lbs.

PRICE.

52 or 104 volts, with grooved or flat pulley	\$40.00
--	---------

Boxing Extra.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

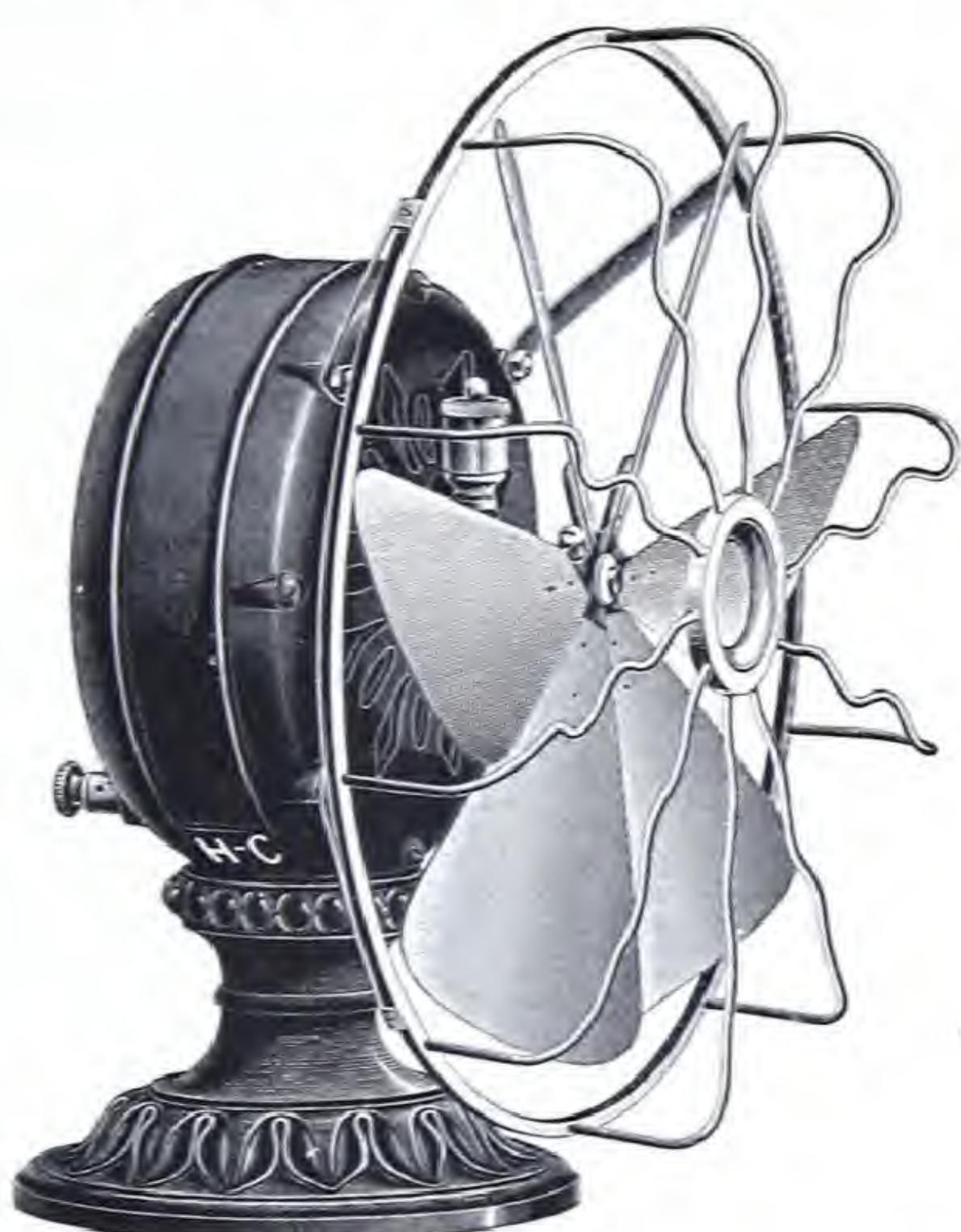
Alternating Fan Motors.

PATTERN 1895.

NO BRUSHES.

NO COMMUTATOR.

SELF-STARTING.



THE above cut represents our Non-Synchronous, Alternating Current Motor. The armature, whose speed is constant at 2000 revolutions per minute, is made wholly of laminated iron. Copper bars insulated by a special process pass through holes near the periphery and are connected at their ends by massive copper rings, thus forming a closed circuit, fire-proof armature. It will be seen that the current in the armature conductors is produced by induction: hence, there is neither collector, commutator nor any external connection required.

On the end of the armature there is an automatic, centrifugal switch of very simple construction which cuts out the starting coils when the armature has reached a certain speed. These starting coils are wound in such a relation to the working coils that their combined action produces a starting torque. When full speed is reached the current from mains merely passes through the main or working coils. The Motor is practically noiseless in operation, artistic in design, and is finished in nickel.

FULLY GUARANTEED IN EVERY RESPECT.

PRICE LIST.

No. 95. Alternating Motor, 52 or 104 volts, without Guard,	\$37.00
Guard for above, extra	3.00

SPECIAL NOTICE.—State in ordering whether it is to be used on high or low frequency systems, and the number of periods or cycles per second. Low frequency machines are only made to order.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Fan Motors.

(CONTINUED)

ALTERNATING CURRENT MACHINES.

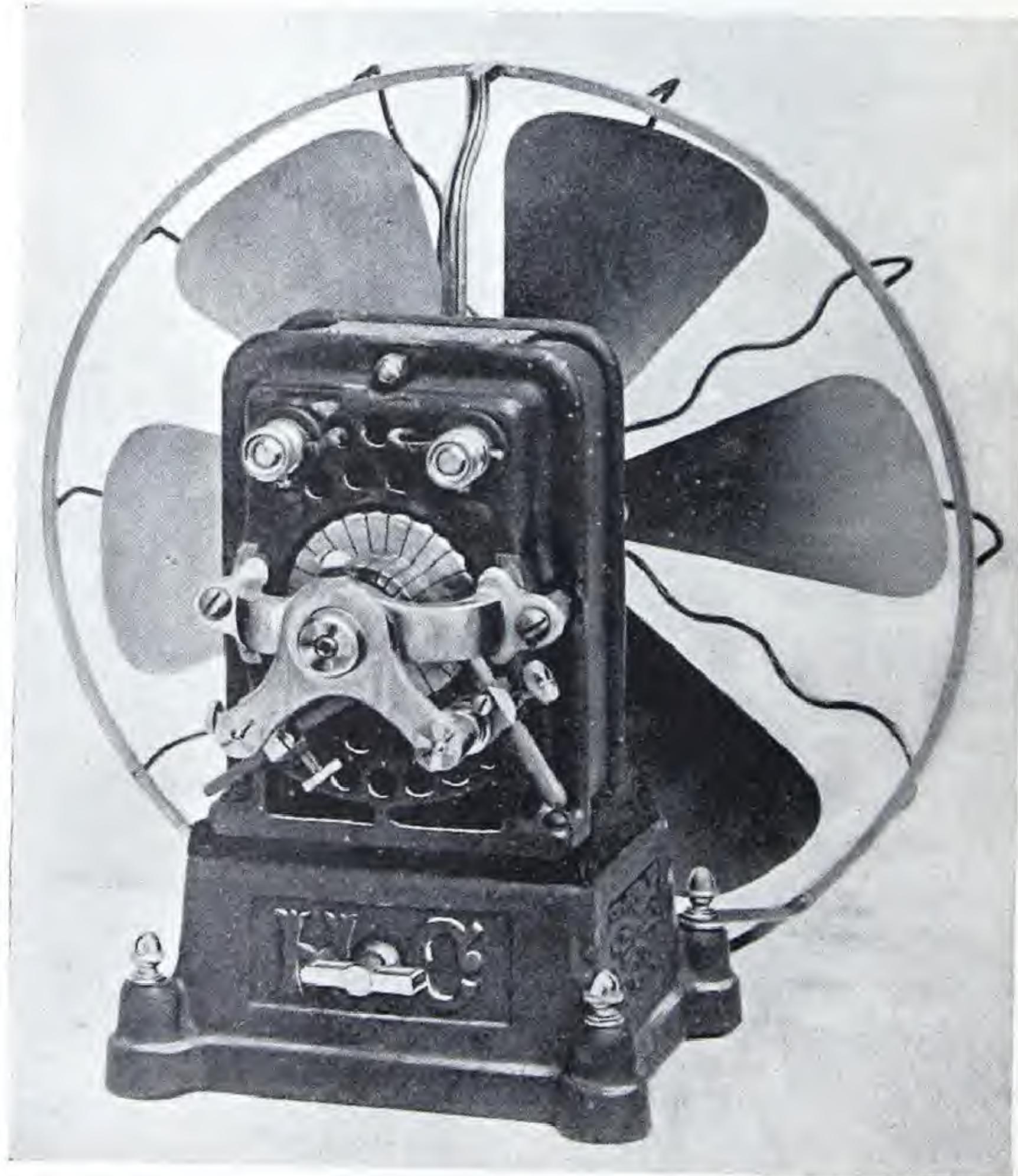
A VERY POWERFUL MOTOR. FULLY GUARANTEED.

We offer this Motor to the trade as the outcome of many experiments and of long practical tests.

It is a Multipolar machine, having very finely laminated fields and armature, with a substantial commutator.

The defects usually common in Alternating Fan Motors, such as heating, sparking, and enormous consumption of current, are in this machine notably absent.

It is thoroughly made and well finished, and it is furnished with a 12-inch Fan and speed regulating switch.



Class A C I Pattern 1394 1-8 H.P. ALTERNATING FAN MOTOR.
52 or 104 Volts, with 12-inch Fan and 2-speed Switch.

PRICE LIST.

Alternating Fan Motor, $\frac{1}{8}$ H.P., 52 or 104 volts	..	..	..	..	\$37.00
Guard for above, 12-inch Fan	..	..	..	..	3.00

See page 26 for cut showing style of Guard used with this machine. FULLY WARRANTED.

Boxing Charged at Cost.

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Fan Motors.

(CONTINUED)

DIRECT CURRENT MACHINES.

Pattern M 00, 110 Volts. — Highly Finished. — Noiseless.



Class M 00, Form F. Fitted with Grease Caps.

THIS Machine has received unstinted praise since its introduction in 1893. It requires practically no attention and is noiseless except the hum produced by the vibration of the Fan Blades. Please note that we furnish it with a 2-speed Switch without extra charge. Its parts are fully Nickelled and Japanned, and it is an ornament to any room or office.

PRICE LIST.

$\frac{1}{6}$ H. P., 12-inch Fan, 110 Volts.	\$37.00
" " " 220 "	44.00
" " " 500 "	48.00
Speed Regulating Rheostat, 220 to 500 Volts, separate from Motor.	15.00
" " " 110 Volts, net	12.00
Guard, 12-inch, extra	3.00
" 15-inch, "	3.50
15-inch Fan, extra	2.50

Boxing Charged at Cost.

...THE HOLTZER-CABOT ELECTRIC COMPANY....

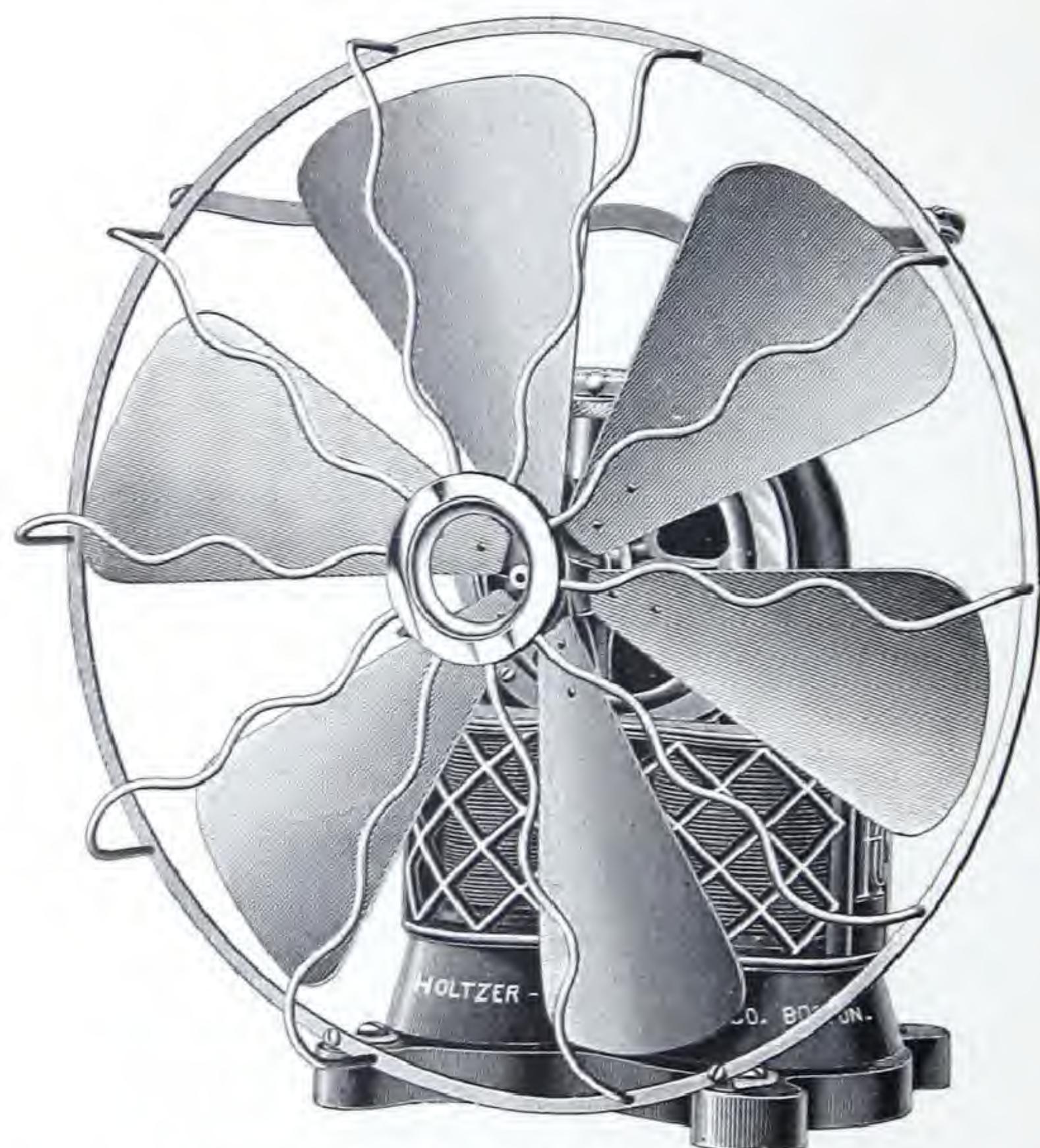
Boston, Mass.

Fan Motors.

(CONTINUED.)

DIRECT CURRENT MACHINES.

CUT ILLUSTRATING FAN MOTOR GUARD.



Pattern M 00. FAN MOTOR WITH GUARD.

We furnish the style of guard illustrated above with any of our 12 or 15-inch Fan Motors illustrated and described on adjacent pages. It is substantially built and fully nickelled and polished.

PRICE LIST.

Guard for 12-inch Fan, Nickel Finish	.	.	.	.	.	.	\$3.00
" " 15 "	"	"	"	"	.	.	3.75
" " 12 "	"	Plain Black or Brass	.	.	.	.	2.00
" " 15 "	"	"	"	"	"	.	3.00

BRONZE FINISH TO ORDER

....THE HOLTZER-CABOT ELECTRIC COMPANY....

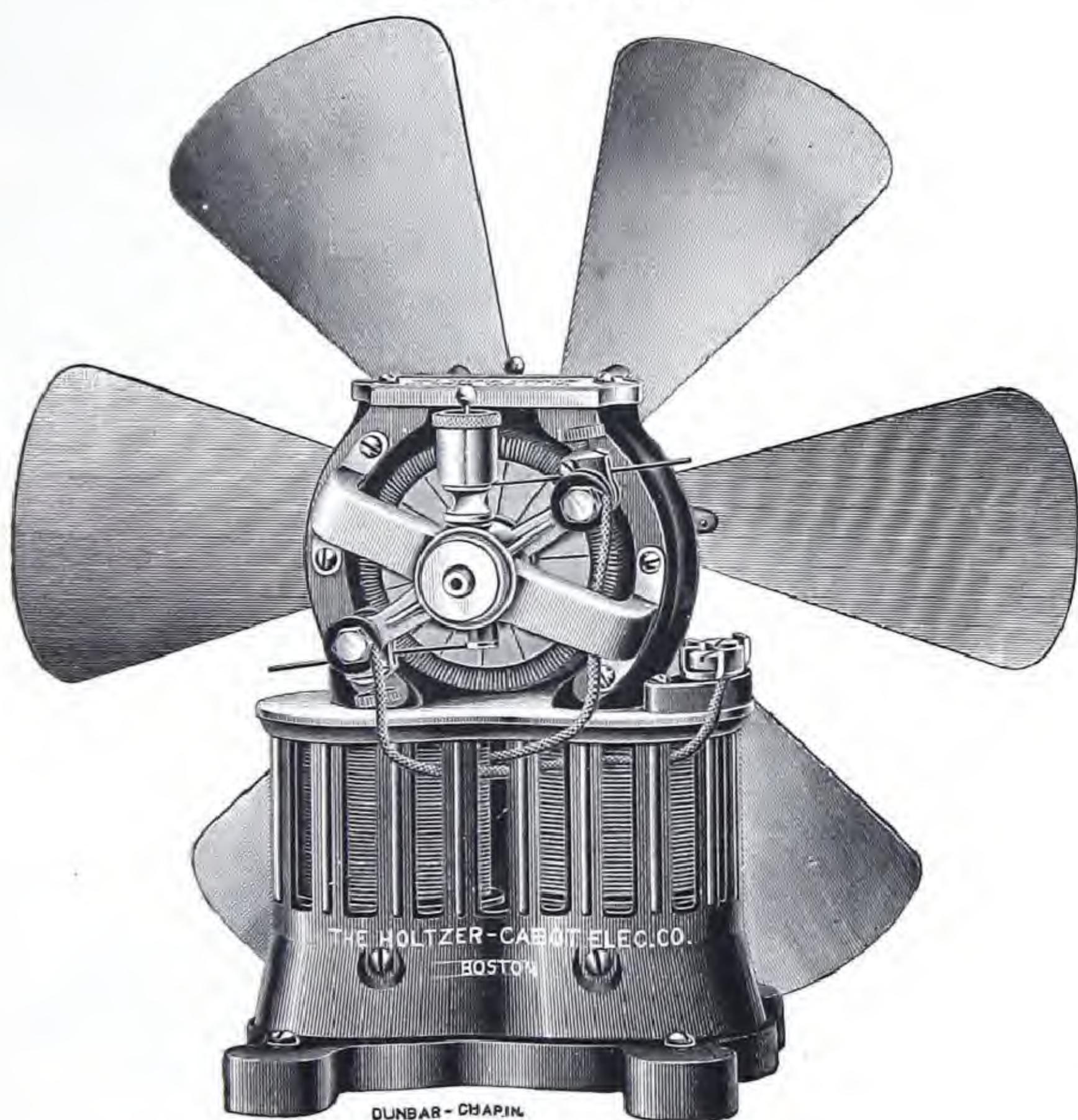
Boston, Mass.

Fan Motors.

(CONTINUED.)

DIRECT CURRENT MACHINES.

TRADE PATTERN.



This Motor is identical with our Standard Model (see page 26), except that it is finished in plain brass and japanned. Provided with 2-speed switch.

PRICE LIST.

1/8 H. P., 12-inch Fan, 110 volts	•	\$32.00
1/8 " " 220 "	•	38.00
1/8 " " 500 "	•	44.00
Speed Regulating Rheostat, 220 to 500 volts, separate from Motor,	•	15.00
" " 110 volts, separate from Motor,	•	12.00
Guard, 12-inch or 15-inch, extra	•	2.00
15-inch Fan, plain brass, extra	•	2.50

Boxing Charged at Cost.

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

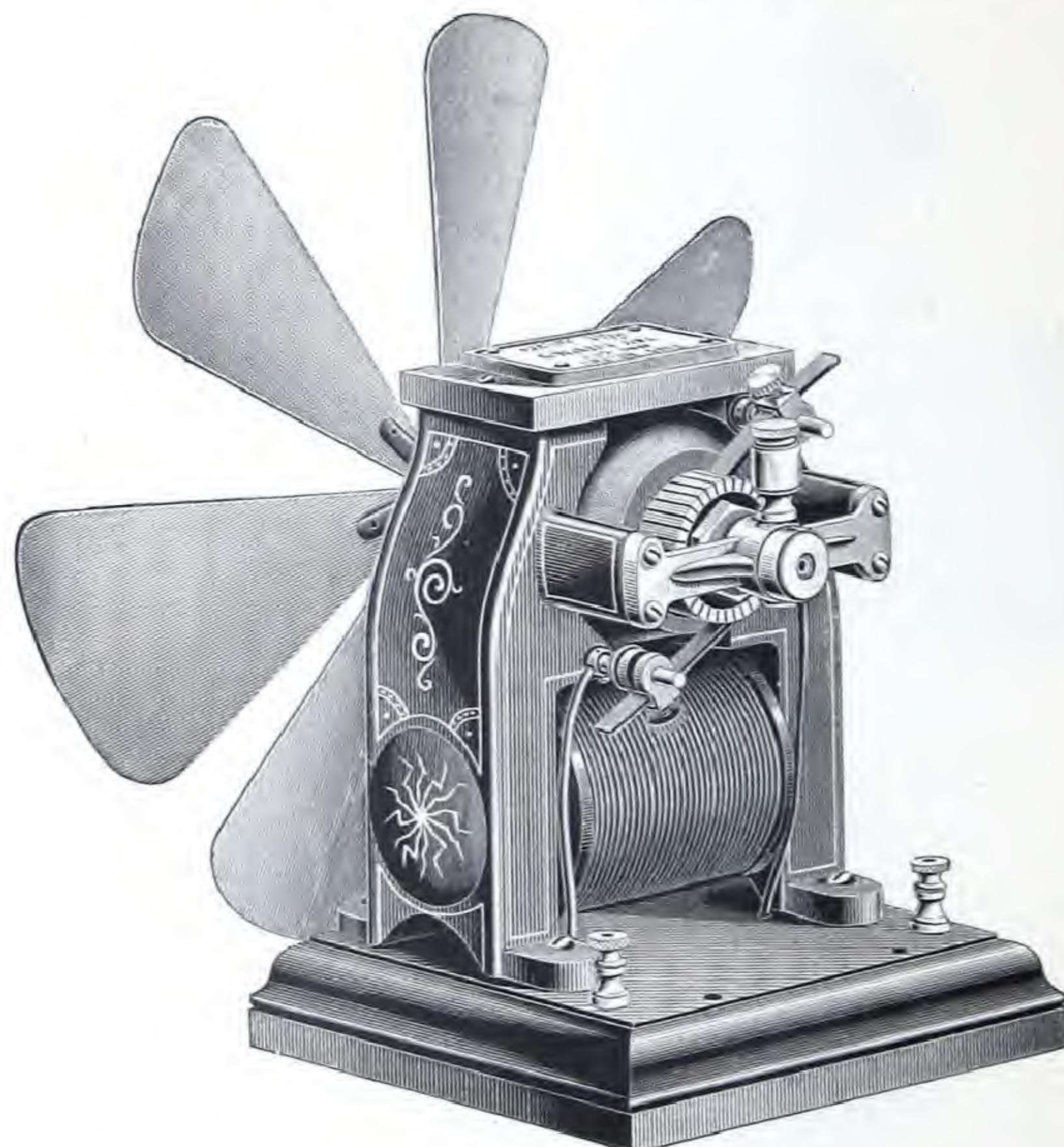
Fan Motors.

(CONTINUED.)

DIRECT CURRENT MACHINES. HIGH POTENTIAL MOTORS.

220 to 500 Volts.

Fitted with Grease Cups.



Form V 2.

1-5 H.P. 110-500 Volt Fan Motor. Furnished with one or two 15-in. Fans

THE various layers in the Magnet and Armature Coils of this machine are highly insulated. We call attention to the large number of commutator segments, and to its perfectly-built armature, which can be run with fan off up to 6,000 revolutions without danger. It is very powerful, throwing wind about 50 feet.

PRICE LIST.

V. 2 F., 1-5 H.P., 110-220-500 Volt (Speed 1,750), with 15-in. Fan	\$.56.00
V. 2 F., 1-5 H.P., 110-220-500 Volt (Speed 1,750), with two 15-in. Fans, one on each end shaft	60.00

Boxing Charged at Cost.

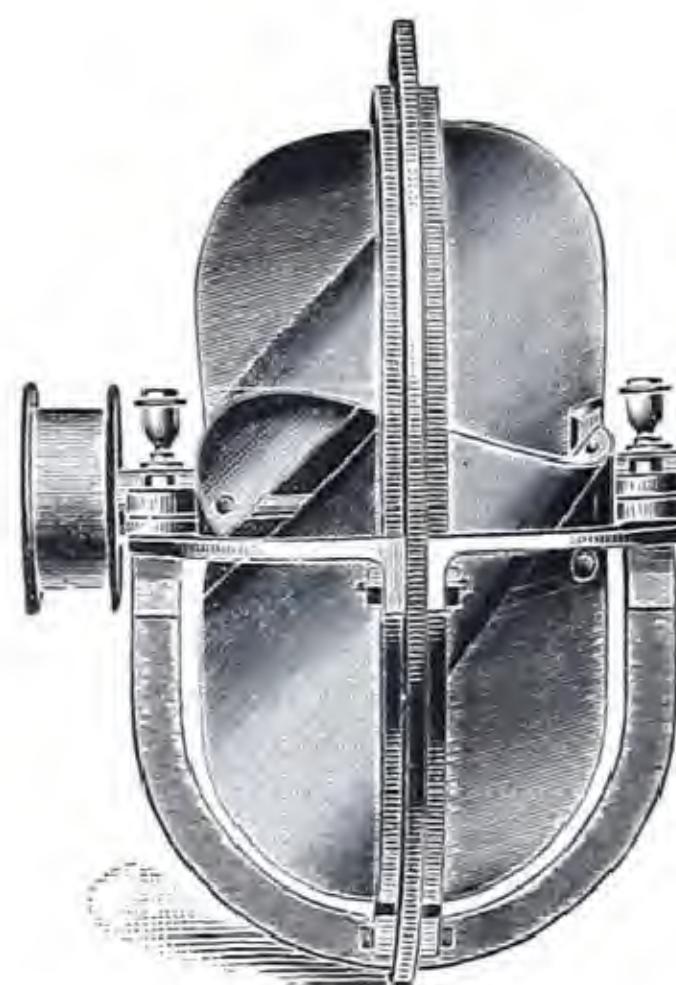
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Exhaust Wheels.



FACE VIEW.



EDGE VIEW.

Pat. Jan. 25, 1887.

PLEASE NOTE.

WE have found by actual trial that this Wheel performs excellent service in conjunction with our motors, and are prepared to contract for complete installations or for goods F. O. B. Boston, with full and explicit instructions for setting and operating for any purpose for which fans are applied.

This Compound, Scoop-bladed Wheel is well known wherever in the United States or Canada manufacturing plants are found. Its durable construction and superior ability have made it a standard among buyers who have hard work to do, and who look at the work which a fan actually does when running, rather than what they are told it ought to do.

We are prepared to give estimates on complete ventilating outfits for hospitals, offices, mills, public buildings, etc., and from our long experience in this work can guarantee satisfaction.

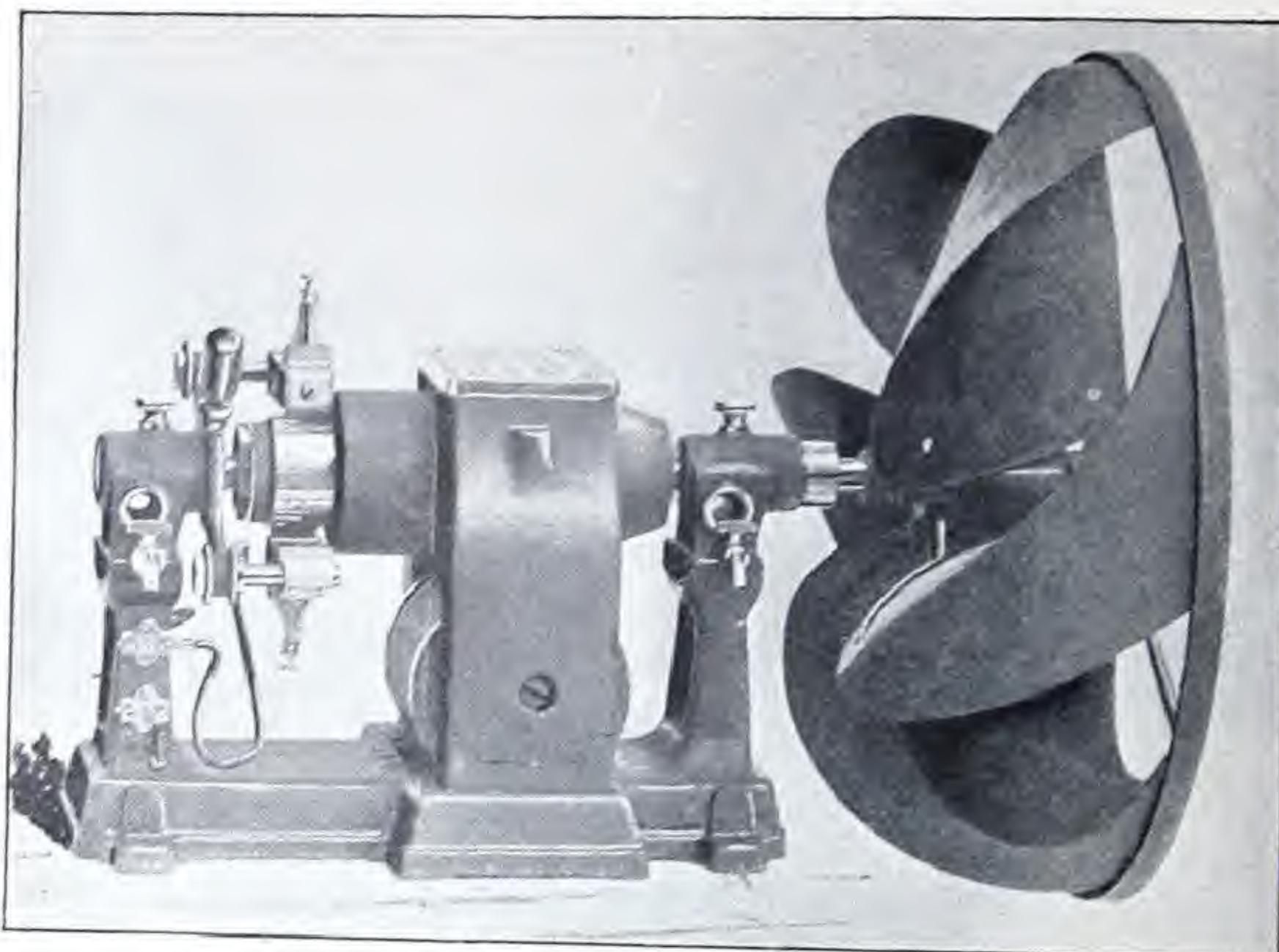
SEE PAGE 30 ALSO.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Ventilating Outfits.

DIRECT, COUPLED AND BELTED.



ONE H. P. MOTOR AND 30-INCH. EXHAUST WHEEL, DIRECT DRIVEN.

SPECIFICATION AND PRICE LIST H.-C. VENTILATING OUTFITS.

CLASS.	H. P.	VOLTAGE	SIZE OF WHEEL.	SPEED.	Cu. ft. Air Moved. Free Circulation.	PRICE COMPLETE.
M 00 E	$\frac{1}{8}$	110-220	12 in. Fan.	1500	1300	\$40.00
M 00 E	$\frac{1}{8}$	500	12 " "	1500	1300	50.00
M 2 E	$\frac{1}{4}$	110-220	15 " "	1600	1600	80.00
M 2 E	$\frac{1}{4}$	500	15 " "	1600	1600	90.00
M 3 E	$\frac{1}{2}$	110-220	18 " wheel.	900	2400	145.00
M 3 E	$\frac{1}{2}$	500	18 " "	900	2400	160.00
M 4 E	1	110-220	24 " "	825	5600	205.00
M 4 E	1	500	24 " "	825	5600	215.00
D 2 E	2	110-220	30 " "	750	9000	280.00
D 2 E	2	500	30 " "	750	9000	290.00

Fire proof Speed Regulating Boxes are furnished with all sizes above $\frac{1}{8}$ H. P.
Estimates for belt-driven Fans and special application furnished.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Special High Voltage Testing Apparatus.

THE illustration shows a testing apparatus with which insulators and insulating material of any kind and in any shape can be safely and rapidly tested. Mica, moulded mica, rubber and their various compounds in the shape of sheets, rings, tubes, &c., may be subjected to a mechanical pressure and an alternating electrical stress of from one to ten thousand volts.

An insulation slightly defective will often show perfect under the comparatively feeble magneto current generally used for this purpose, but will invariably break down in actual service, while if such a machine as the above is used in testing, the defect will immediately show itself. As here shown, it is arranged for testing railway insulators, from one to five being placed in the insulating sockets and the handle depressed so as to make contact successively at the metal part of the insulators. If the insulation of same is perfect, only a very slight spark will be noticed on breaking the circuit, due to surface leakage and condenser action; should, however, the insulation be defective, it will at once break down under the stress, the pilot lamp will light up to full candle power, and the characteristic hum of the alternating arc will be at once noticed.

There is no danger whatever in operating this apparatus, as all parts conveying the high pressure are shielded, and connection with the transformer is made only at the instant of actual contact with the material under test.

Leading manufacturers of insulators and insulating compounds are using this apparatus with a consequent saving of time and greater uniformity of product.

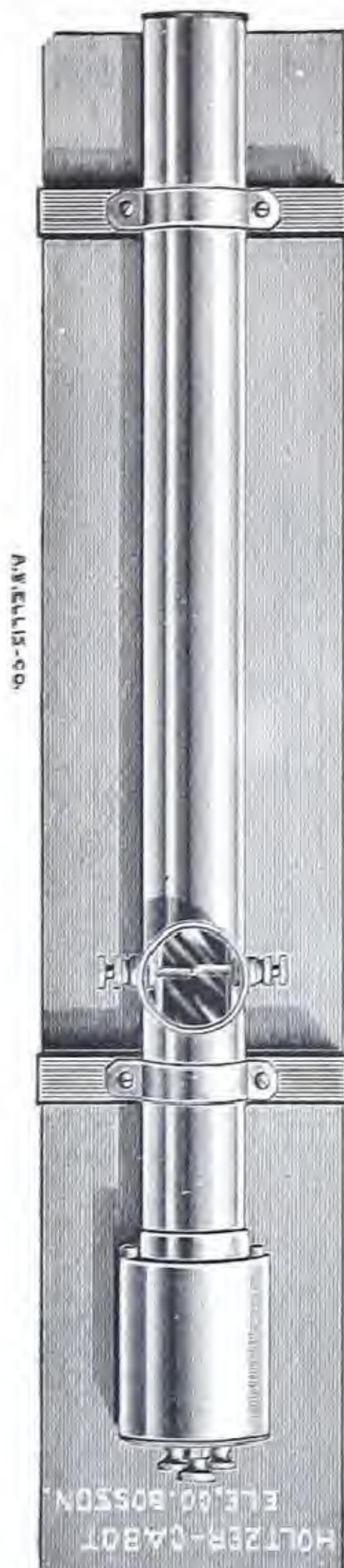
PRICES AND ESTIMATES ON APPLICATION.



....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The H.-C. Alternating Current Potential Indicator.



H.-C. Alternating
Current Indicator.

FOR CONTROLLING ALTERNATING DYNAMOS IN STATIONS.

THIS instrument is made on the principle of the Cardew Voltmeter, which is well known to be the most reliable of any instrument in present use for indicating the pressure on alternating current circuits.

It may be used as a simple Indicator, or in connection with Controller illustrated and described on succeeding pages.

Being capable of the finest adjustment, it will indicate accurately a change of voltage of one-half of one per cent above or below normal.

While specially designed for alternating currents, the needle is so light that it is unaffected by vibrations, and may be used for direct currents in stations where the vibration is so great as to interfere with the working of ordinary instruments.

In addition to serving as a potential indicator or operating Dynamo Field Controller, this instrument may be applied so as to automatically control the operation of Stillwell regulators or "boosters" which are now used in many A. C. plants. So that while the Dynamo as a whole is under automatic regulation, individual circuits on which "boosters" are used can be connected to a special controller and indicator, thus reducing close attention to the switch-board to a minimum.

It will be noticed that connections for both the A. C. and direct current indicators are identical so far as the principle of operation is concerned, the solenoid of the direct current instrument being replaced by the hot wire in the A. C. indicator.

Price \$50.00

SEE DIAGRAM OF CONNECTIONS ON PAGE 38.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

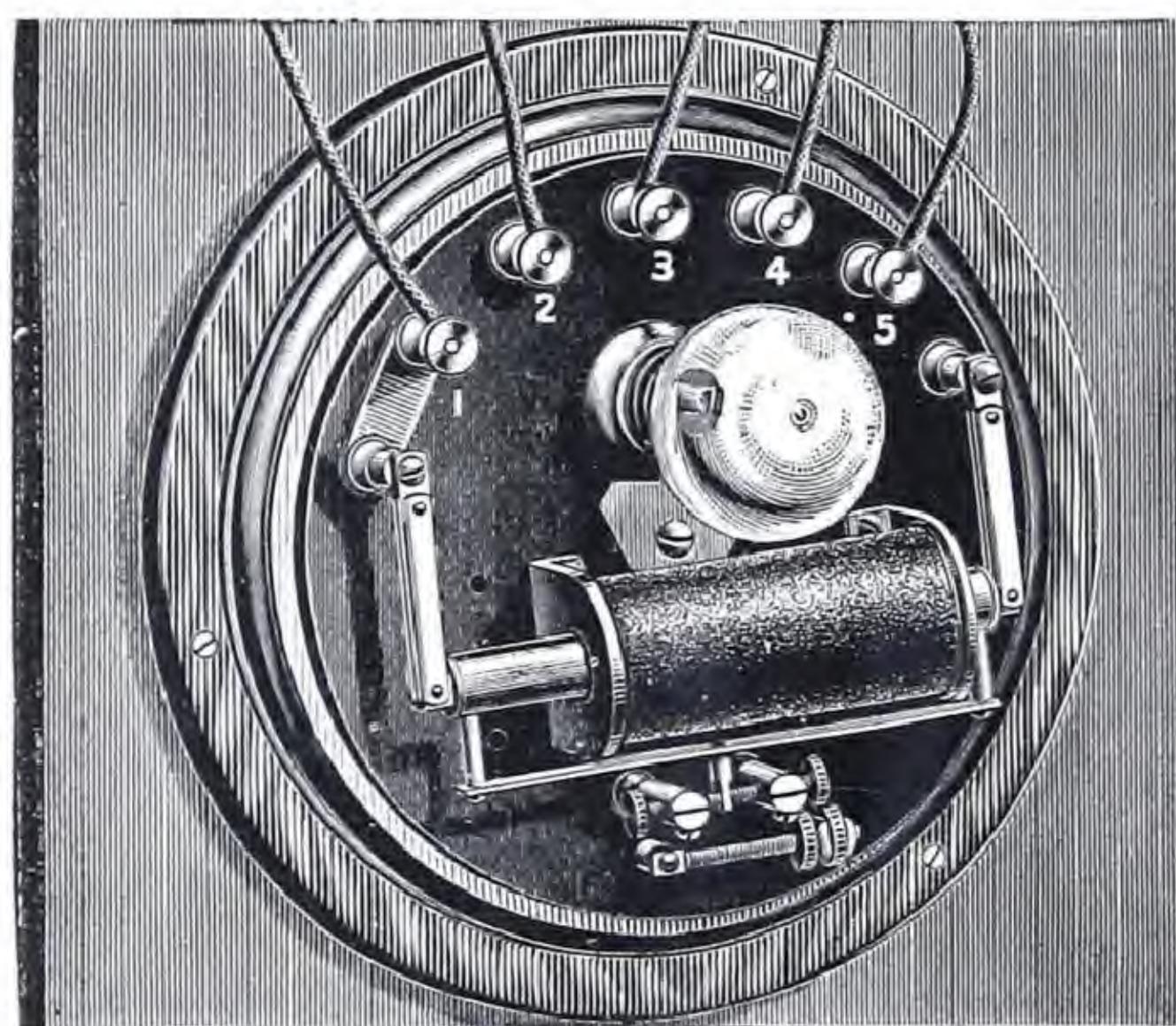
The H.-C. Pressure Indicator.

(PATENTED.)

VOLTAGE.—E. M. F.—PRESSURE.

THE necessity and importance of keeping close watch on variations in **pressure upon lamps** need no describing. All who have lamps to pay for, or good light to maintain, or who are responsible for the satisfactory working of Dynamos, daily realize this. Obviously, therefore, any indicator capable of instantly calling attention to Pressure variations must render valuable service in a Dynamo Room.

The Holtzer-Cabot Pressure Indicator performs precisely such service, by means of two Signal Lamps—a **red** lamp to give warning when Pressure is too high, and a **green** lamp to notify when Pressure is too low—neither lamp burning when Pressure is normal. This instrument, if so placed that its signals can be seen from all points in the Dynamo Room, renders invaluable aid to the Superintendent who, however otherwise employed, is able at a glance to know the precise condition of his Pressure.



OPERATION OF THE INDICATOR.

Reference to the accompanying cuts will show that the Indicator consists essentially of a core suspended within a solenoid, and balanced between the effect of gravity and the magnetic effect of the solenoid.

The terminal numbers 4 and 5 are those of the solenoid in series with which is placed the white lamp shown. These terminals are connected respectively with either side of the circuit at the point where it is desired to observe the condition of the Pressure.

Terminal numbered 1 is connected with one side of the circuit and with the contact that moves with the core.

Terminals 2 and 3 are connected with the other side of the circuit through the green and red lamps to the left and right fixed contacts respectively.

Consequently:—

FIRST. A rise in Pressure draws the core up and makes contact to the right, closing the circuit through the red lamp.

SECOND. A fall in Pressure allows the core to drop by gravity and makes contact on the left, closing the circuit through the green lamp.

Price of Indicator (as above) \$37.50

SEE DIAGRAM OF CONNECTIONS ON PAGE 38.

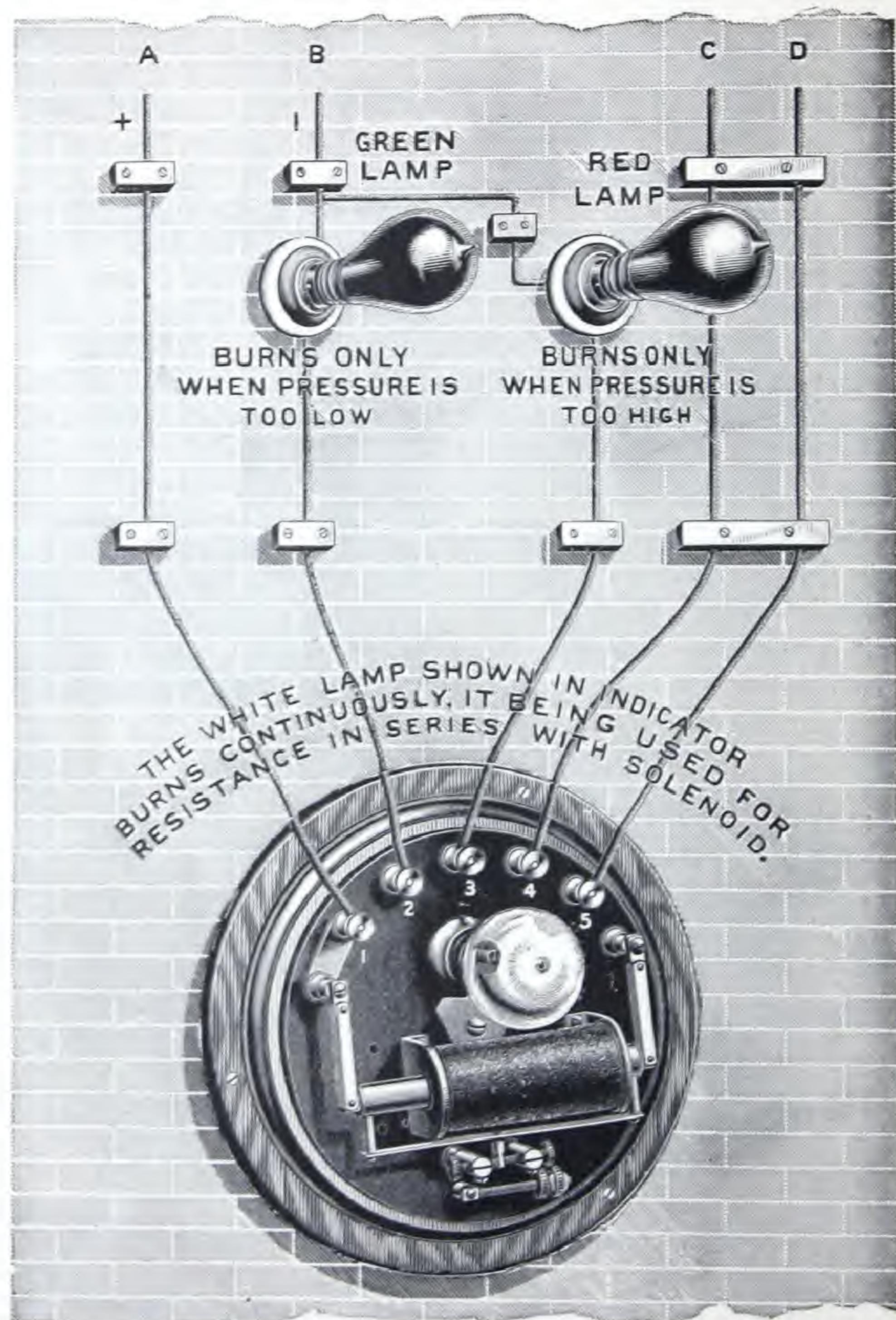
....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The H.-C. Potential Indicator.

(CONTINUED.)

DIAGRAM OF CONNECTIONS.



NOTE.—We do not furnish lamps, etc., with Indicator; this illustration being intended merely to show plan of wiring.

SEE PAGE 38 FOR DIAGRAM OF CONNECTIONS WITH AUTOMATIC CONTROLLER.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

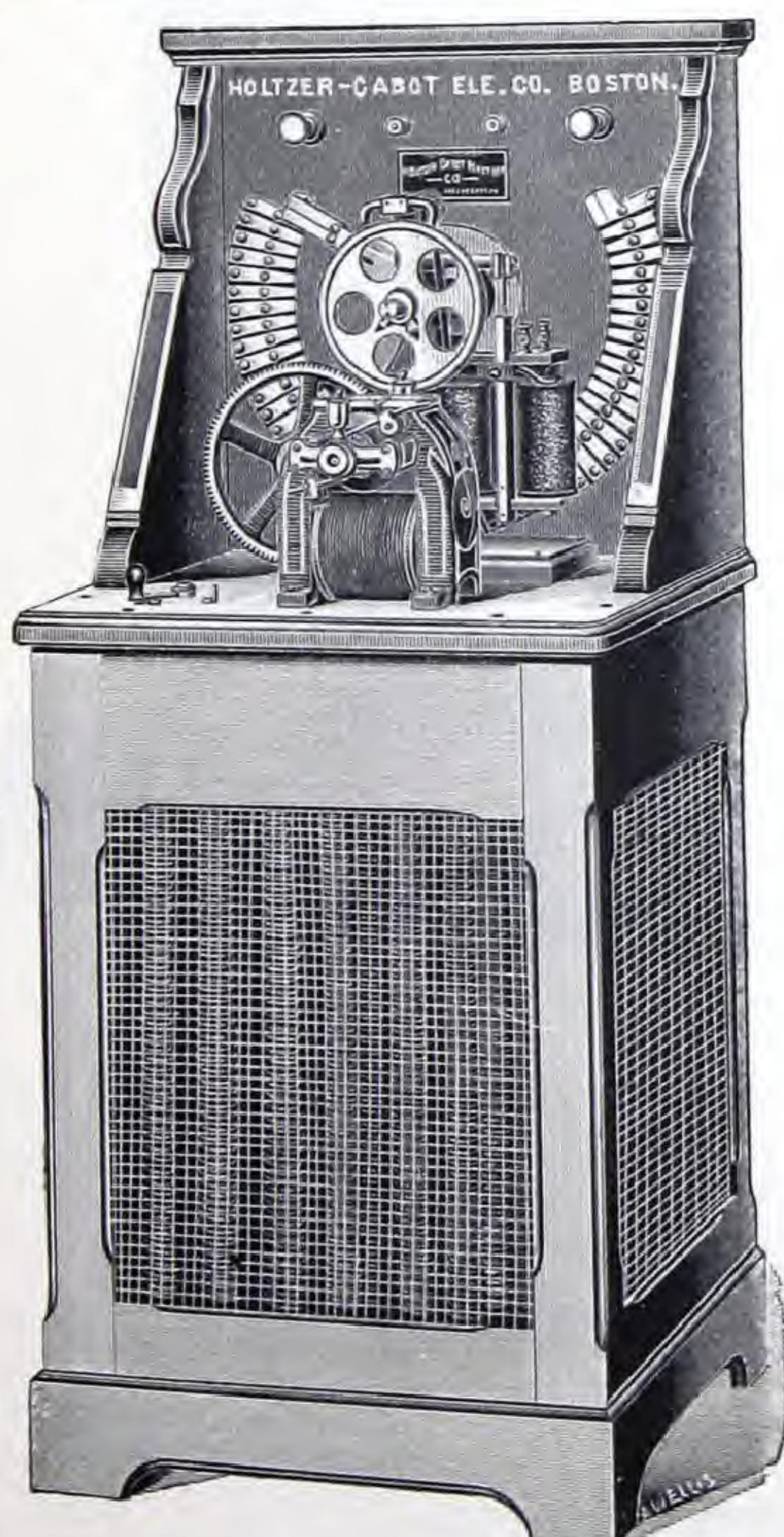
The Holtzer-Cabot Automatic Pressure Controller.

(PATENTED.)

IT IS practically impossible for station attendants to care for their rheostats so closely as to keep the pressure in the line constant all the time. By using the **Automatic Pressure Controller** the attendant's time may be saved for other work, as the pressure indicator will operate our automatic controller under the slightest variation. No station attendant can do this work as perfectly as this controller will do it.

The Holtzer-Cabot Automatic Pressure CONTROLLER is an apparatus designed to work in conjunction with the Holtzer-Cabot Pressure INDICATOR, and to automatically maintain a CONSTANT PRESSURE at any desired point of a system. The Controller actuated by the Holtzer-Cabot Pressure Indicator AUTOMATICALLY OPERATES a rheostat which may be placed either in the field of a dynamo or in the main circuit. The Controller is driven by a belt from some convenient shafting when such power is obtainable, but it is also made to be driven by a $\frac{1}{8}$ H.P. motor.

It is invaluable for the regulation of pressure where it is difficult to obtain an EVEN DYNAMO SPEED, as where power is derived from turbines. It is also of SPECIAL SERVICE in connection with a storage battery for maintaining a CONSTANT LAMP VOLTAGE under all circumstances.



Controller and Rheostat (Cabinet Form.)

Controller and Rheostat Combined.

CABINET FORM. FIRE PROOF.

The Controllers shown on following pages are designed for connection with the rheostat ordinarily supplied with dynamos or power generators.

We furnish, however, both compactly arranged in a cabinet form, as shown in adjoining cut.

In ordering Controllers with Rheostat for dynamos other than our own manufacture, give full particulars as to type of machine, size, voltage, amperes, etc.

References of parties using these Regulators will be gladly furnished on application.

Price of Regulator, in cabinet, without Rheostat,	\$200
Price of Regulator and Rheostat arranged in cabinet form	250
Complete with Indicator	300

...THE HOLTZER-CABOT ELECTRIC COMPANY...

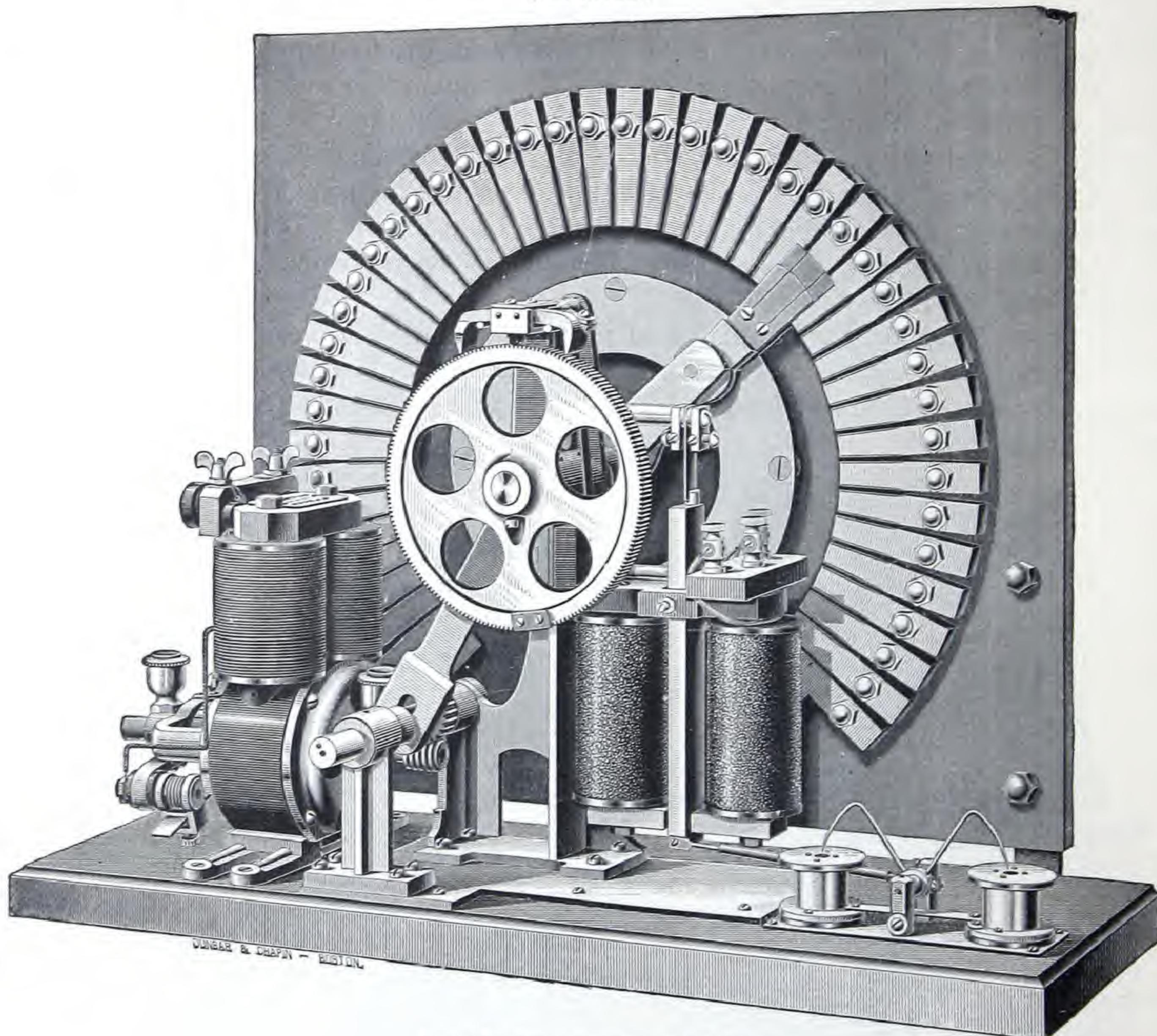
Boston, Mass.

Automatic Pressure Controllers

FOR

LARGE CURRENTS AND STORAGE BATTERIES.

(PATENTED.)



DRIVEN BY 1-8 H. P. MOTOR.

PRICE LIST.

CAT. NO.

PRICE.

5092. Controller with Motor (for currents up to 15 amp.)

\$150.00

5094. " " " (for large currents)

200.00

Price does not include Rheostat.

SEE PAGE 38 FOR DIAGRAM OF CONNECTIONS, ETC.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

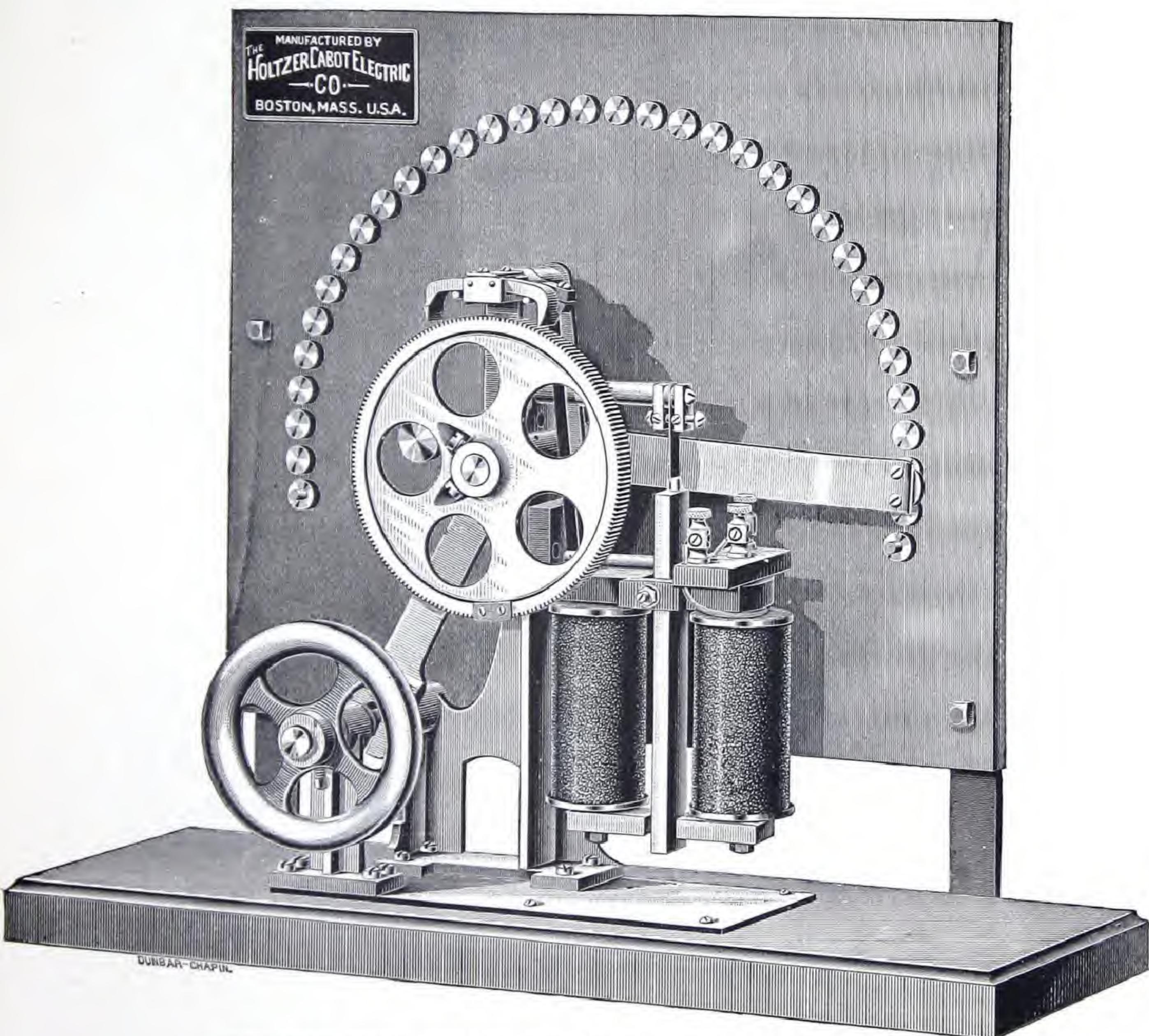
Boston, Mass.

The Holtzer-Cabot Automatic Pressure Controller.

USED IN CONNECTION WITH THE H.-C. PRESSURE INDICATOR.

CUT SHOWING CONTROLLER FOR CURRENTS UP TO 15 AMPERES.

(PATENTED.)



ARRANGED WITH PULLEY TO BE DRIVEN BY COUNTER SHAFT.

PRICE LIST.

CAT. NO.	PRICE.
5091. Controller up to 15 Amperes (with Pulley)	\$100.00
5093. Controller for Large Currents and Storage Batteries	150.00

Above prices do not include Rheostat.

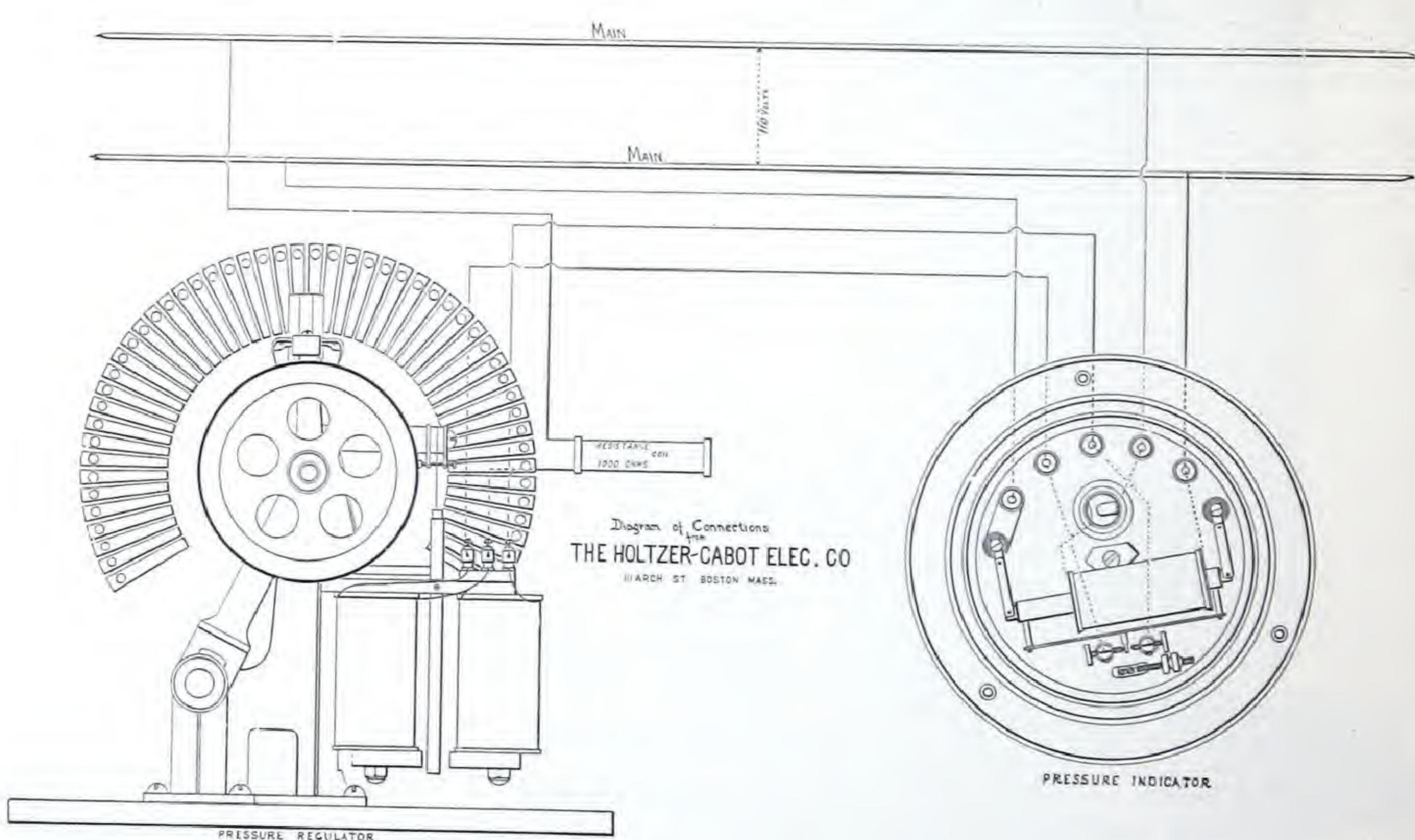
SEE PAGE 38 FOR DIAGRAM OF CONNECTIONS.

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

Diagram Showing Connections of Regulator and Indicator.

SEE PAGES 33 TO 37 FOR DESCRIPTION OF INDICATORS AND CONTROLLERS.



NOTICE.

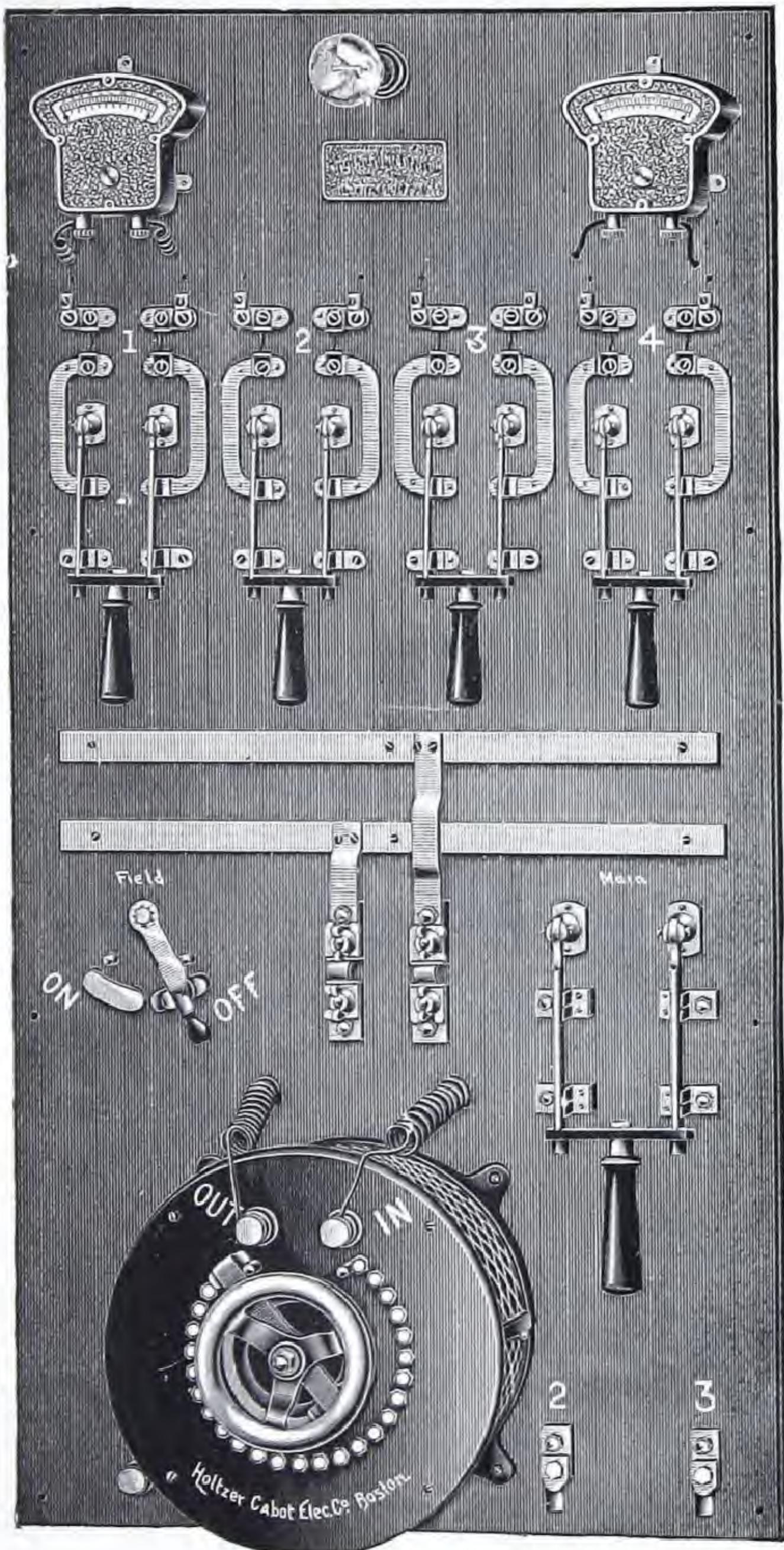
When Potential Indicators and Controllers are to be operated on 500 volt currents, lamp banks for resistance are necessary, and will be charged extra.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Standard Dynamo Switch-Boards.

COMPLETE WITH VOLT AND AMMETER, ETC.



Standard 4-Circuit Board.

ESTIMATES furnished on application for complete switchboards for isolated plants. Give number of dynamos, capacity and voltage, number of circuits, kind of instruments wanted, and capacity of each circuit.

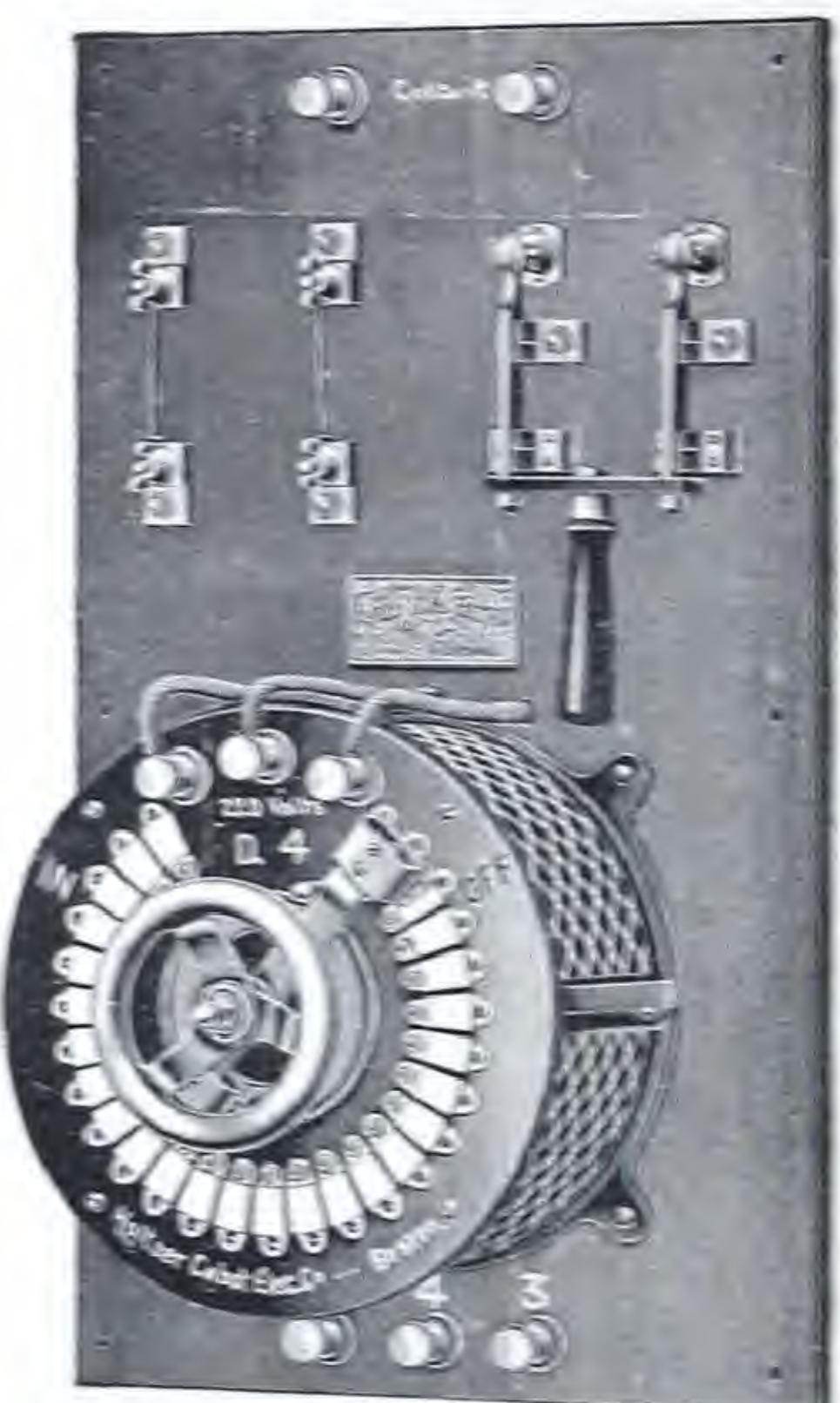
NOTE.—We do not manufacture ammeters or volt meters, but arrange our switchboards so that any make of instrument may be used. These boards are completely wired, so that the only work required of the wireman is to slip the circuit and dynamo wires into their respective binding posts. See pages 41 to 44.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Motor Switch-Boards.

WIRED READY FOR INSTALLATION.



Finely Finished.

Best Construction.

Easily Connected.

Very Compact.

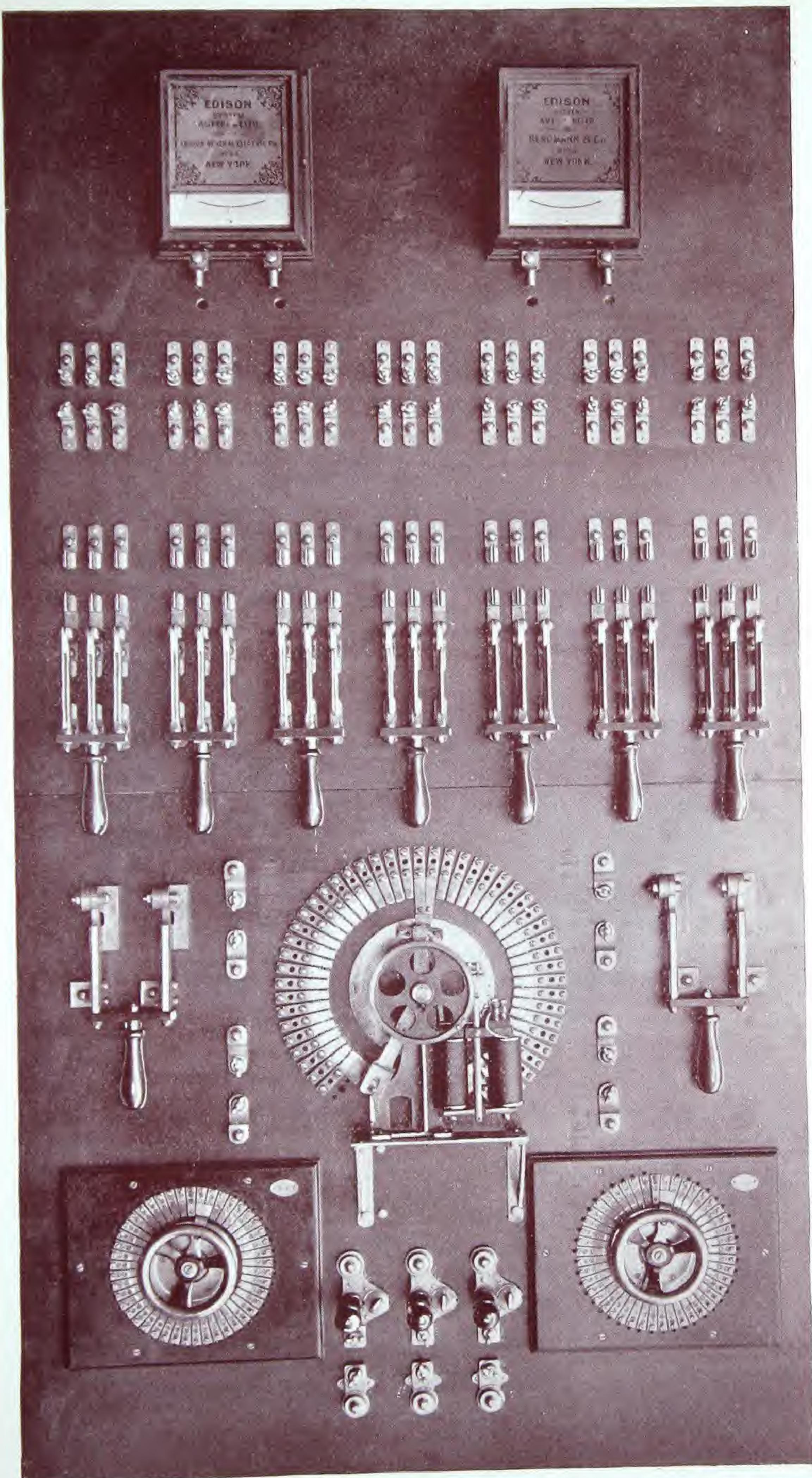
STANDARD MOTOR SWITCH-BOARD.

STARTING BOX NOT INCLUDED.

PRICE LIST.

No.		PRICE.
1.	For Motors M 1 to D 4, Size of Slate, 12 in. x 24 in.	\$30.00
2.	" " D 5 to D 10, " " 14 in. x 27 in.	35.00
3	" " D 15 to D 20, " " 18 in. x 30 in.	40.00

As Rheostats are furnished with all Motors above M 2 in size, these prices include slate base, line and motor terminals, double pole switch and cutout only.



Switch-Board Designed and Built for New Ames Building, Boston, Mass.
(WITH HOLTZER-CABOT AUTOMATIC REGULATOR.)

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CCA

...THE HOLTZER-CABOT ELECTRIC COMPANY...

Boston, Mass.

The Weston Station Voltmeter.



PRICE LIST.

50 Volt Scale—100 Divisions, readable to tenths,	\$26.50
125 " " 125 "	28.25
300 " " 150 "	32.50
600 " " 120 "	35.00

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Weston Station Ammeters.



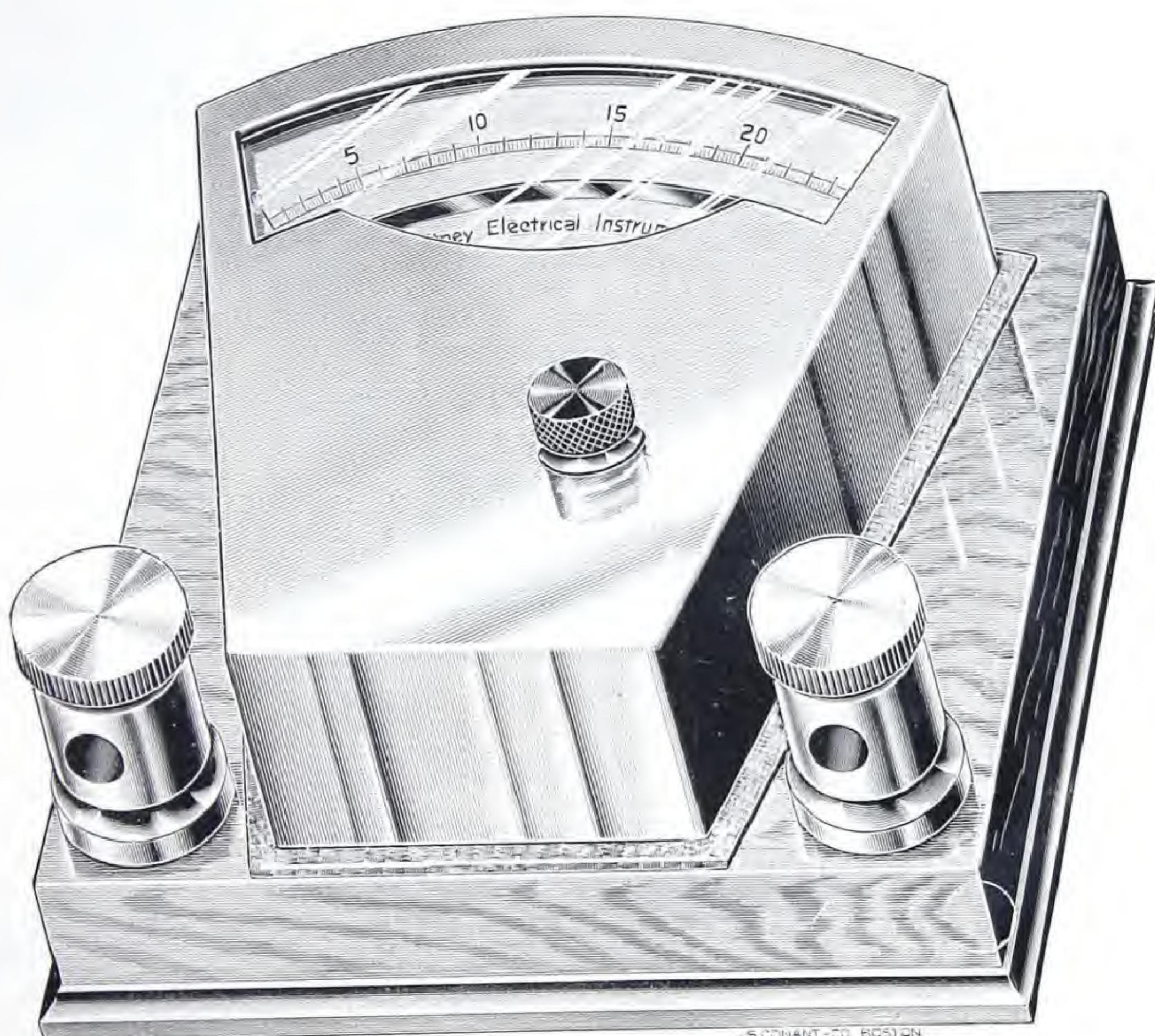
PRICE LIST.

5 Ampere Scale — 100 Divisions, readable to tenths of a division								\$25.00
10	"	"	100	"	"	"	"	25.00
15	"	"	150	"	"	"	"	25.00
25	"	"	125	"	"	"	"	25.00
50	"	"	100	"	"	"	"	25.50
75	"	"	150	"	"	"	"	26.00
100	"	"	100	"	"	"	"	26.50
150	"	"	150	"	"	"	"	27.00
200	"	"	100	"	"	"	"	28.00
250	"	"	125	"	"	"	"	28.25

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Whitney Voltmeters.



PRICE LIST.

Class A, Scale 0—150 Volts in One Volt Division	\$25.00
" B, " 0—300 " " Two " "	40.00
" B, " 0—600 " " Five " "	50.00

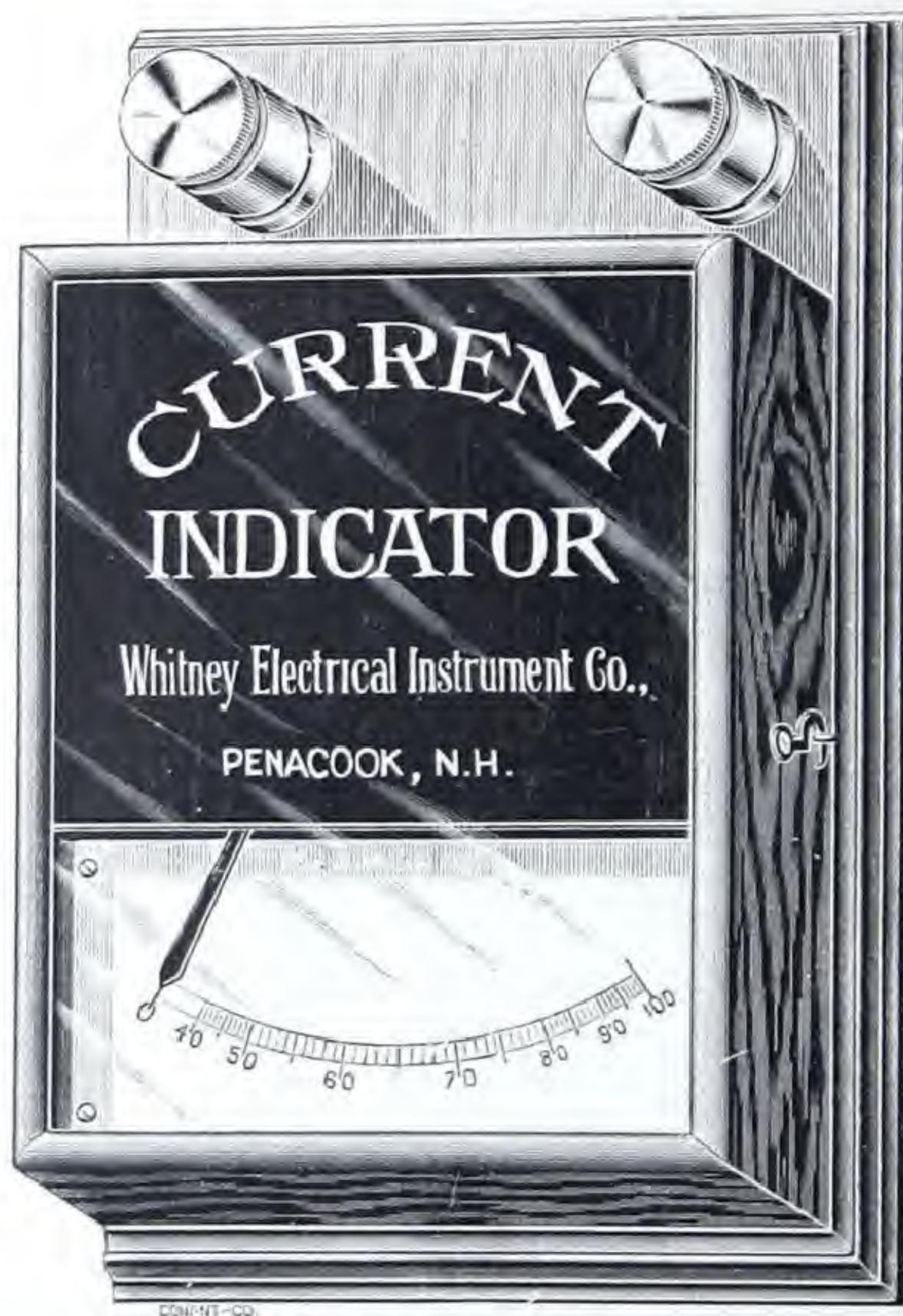
DOUBLE SCALE.

Scale 0—150 Volts, upper scale in 1 volt division	}	\$30.00
" 0—15 " lower " 1-10 " "		

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

The Whitney Current Indicator.



PRICE LIST.

For Circuits of a maximum of 25 Amperes	\$15.00
" " " " 40	15.00
" " " " 60	16.00
" " " " 80	16.00
" " " " 120	17.00
" " " " 320	18.00

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Jack-knife Switches.

PRICE LIST.

Cat. No. 5065.

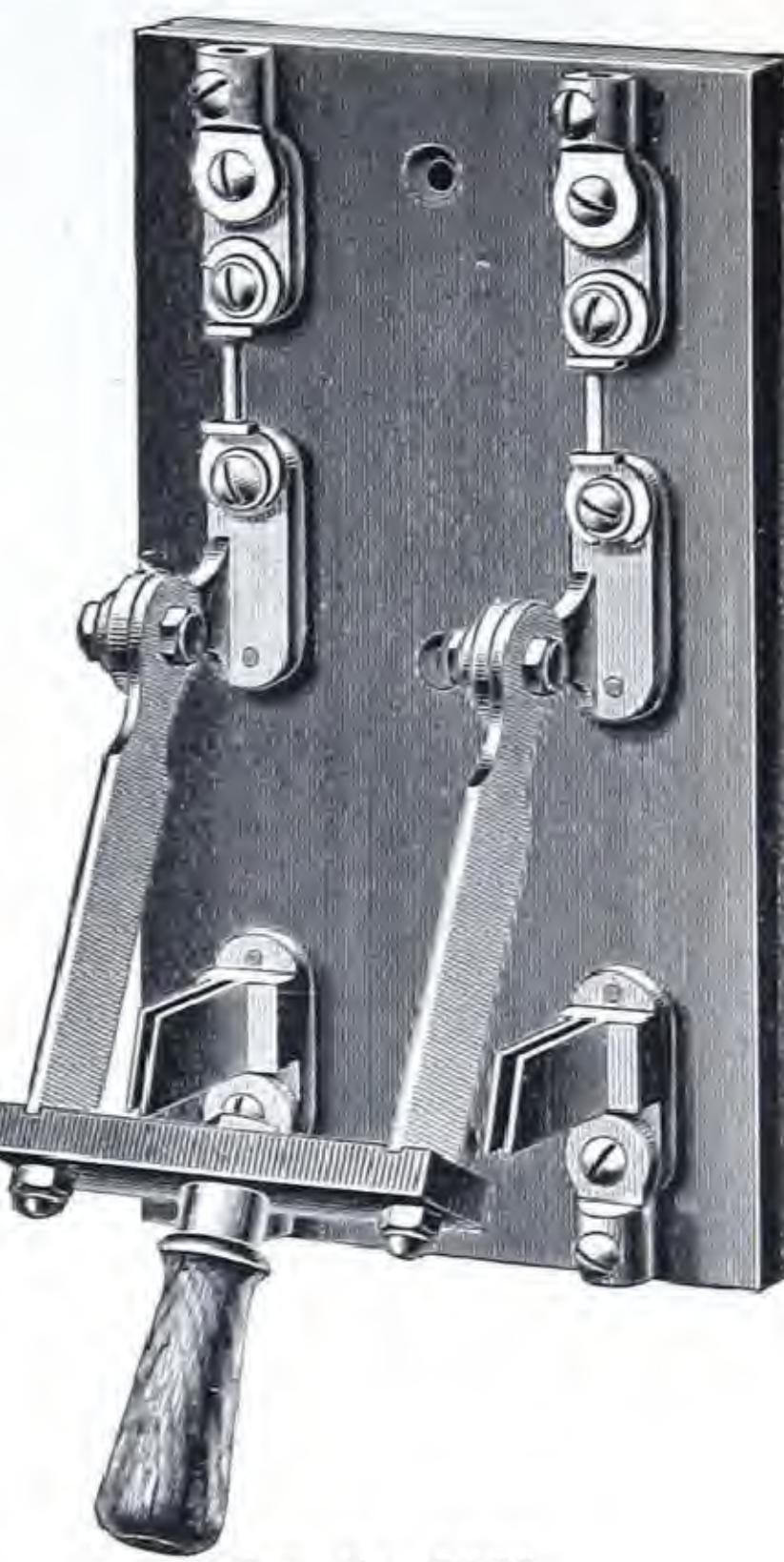
Plain Switch, Polished Slate,
Friction Stop.

30 Ampere	\$6.00
60 "	8.00

Full Finish.

30 Ampere	\$9.50
60 "	11.50

Add one-third for 3-pole switches.



Cat. No. 5060.

Same as above, but with Fuse
Connections.

30 Ampere	\$5.00
60 "	7.00

Full Finish.

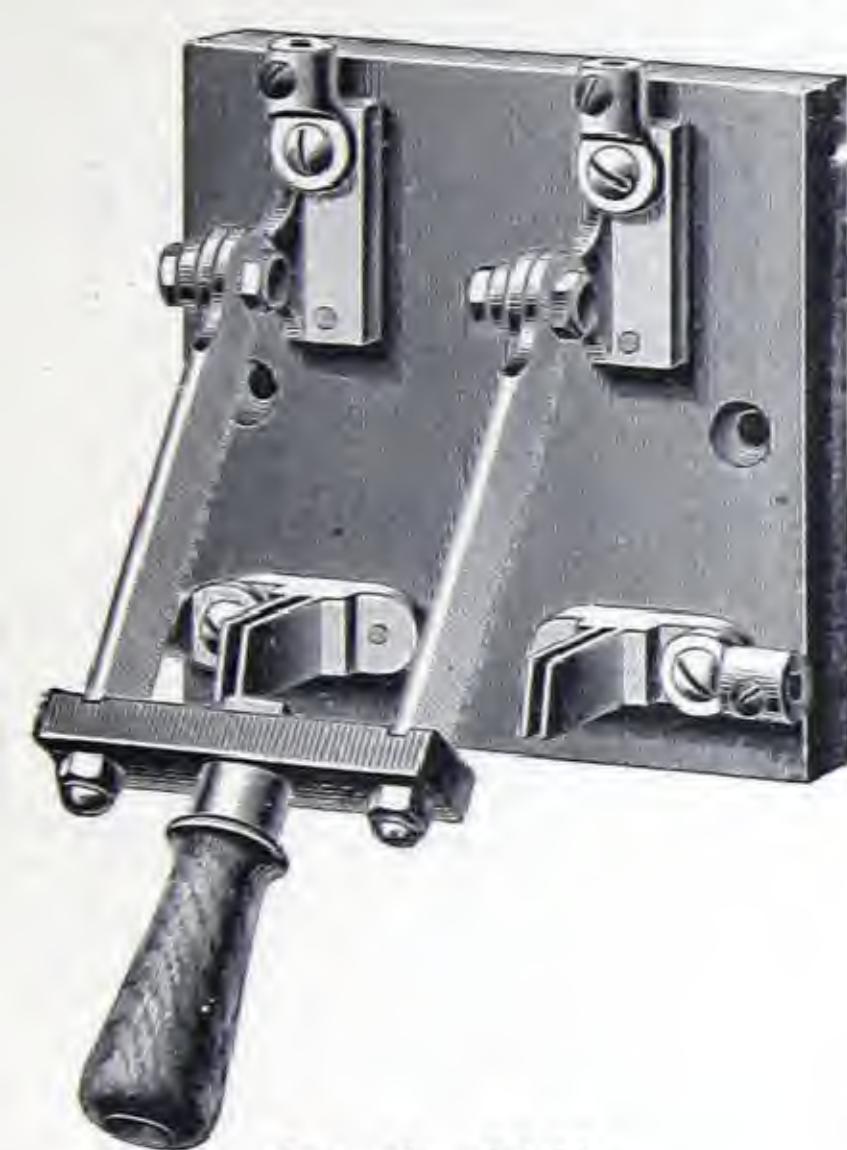
30 Ampere	\$7.50
60 "	9.00

Add one-third for 3-pole switches.

Cat. No. 5065.
The H.-C. Switch,
with Fuse Connections.

Cat. No. 5060.

The H.-C. Switch,
Double Pole, Slate Base,
Friction Stop.



Heavy Motor and Dynamo Switches.

PRICE LIST.

CATALOGUE No. 5055. SINGLE THROW.

Plain Finish.

60 Ampere	\$10.50
100 "	13.00
200 "	21.00
400 "	32.00
600 "	42.00

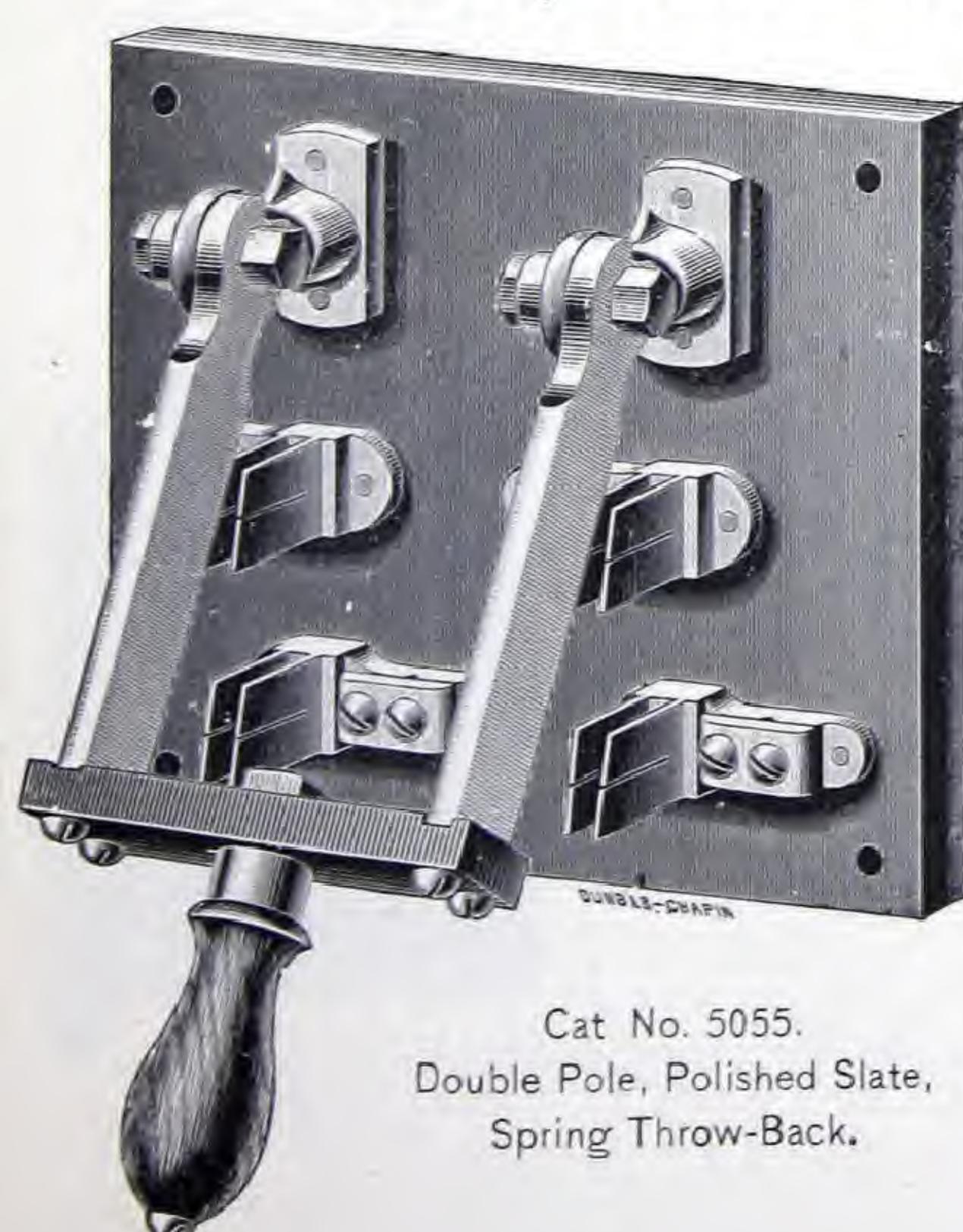
Full Polished.

60 Ampere	\$12.00
100 "	18.00
200 "	26.00
400 "	40.00
600 "	54.00

Add one-third to list for 3-pole switches.

Cat. No. 5055.

Double Pole, Polished Slate,
Spring Throw-Back.



....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.



Jack-knife Switches.

(CONTINUED.)

DOUBLE THROW, TRANSFER.

PLAIN FINISH.

100 Ampere	.	.	.	.	\$19.00
200 "	.	.	.	.	25.00
400 "	.	.	.	.	43.00
600 "	.	.	.	.	49.00

FULL POLISHED.

100 Ampere	.	.	.	.	\$27.00
200 "	.	.	.	.	41.00
400 "	.	.	.	.	67.00
600 "	.	.	.	.	84.00

Add 50 per cent for 3-Pole Transfer.

Testing Generators.

15,000 to 50,000 OHMS.

Substantially built for linemen's use, and provided with strap for carrying. Ringing resistance is plainly marked on each instrument. We can also furnish our regular Standard Magneto (ringing through 15,000 ohms) to parties desiring a magneto with bells on outside of case. The latter may also be wound to ring through as high a resistance as 50,000 ohms.

PRICE LIST.

Testing Generator, 15,000-25,000 ohms (bells inside),	\$10.50
" " 35,000 ohms (bells inside) . . .	12.00
" " 50,000 " " " . . .	15.00
Standard Magneto, 15,000 " (bells outside) . . .	7.50



Cat. No. 477.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Diagrams of Motor and Dynamo Wiring.

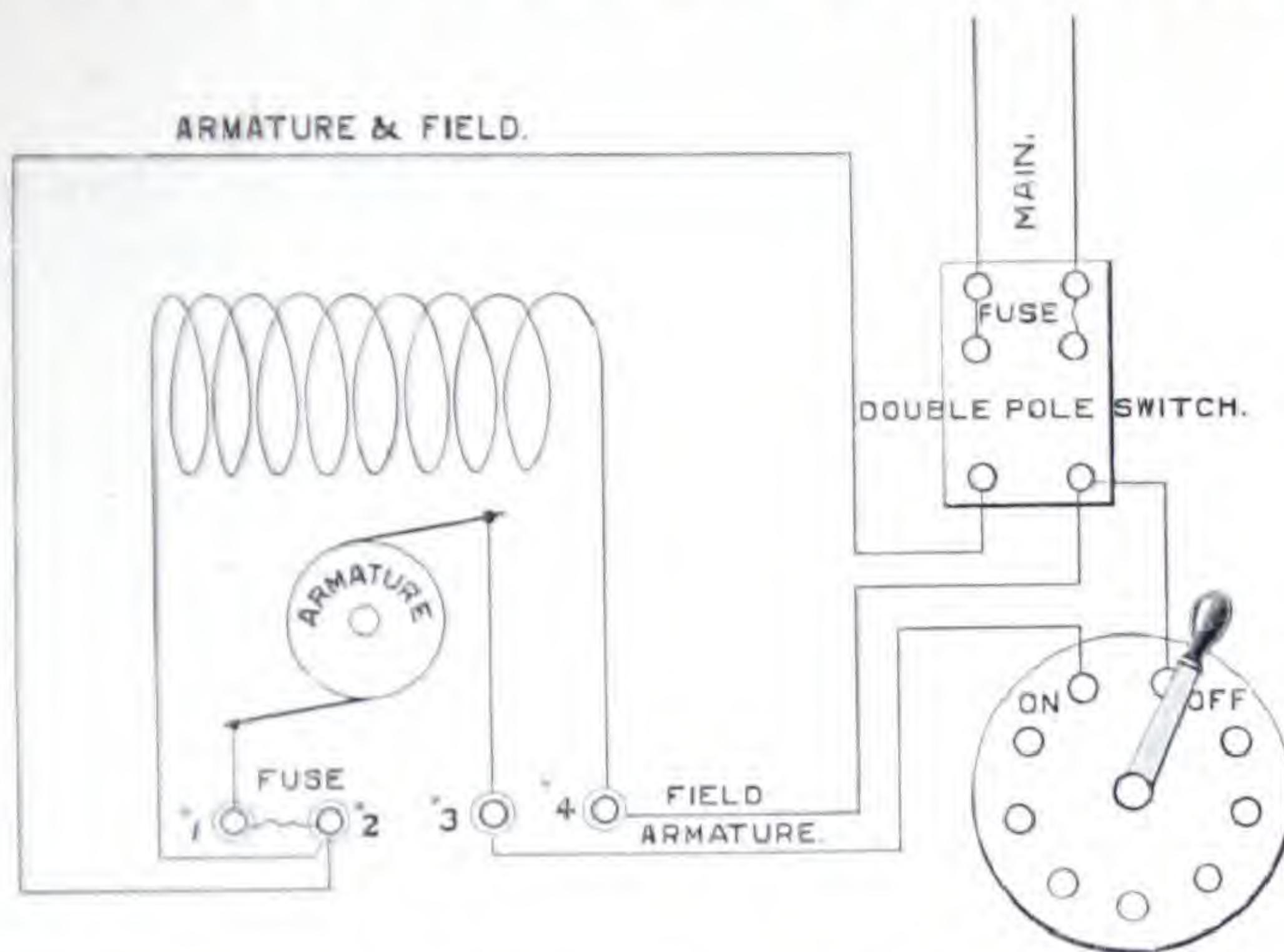


Diagram of Connections for Constant-Speed Motor, with ordinary Starting Box and Double Pole Switch. (2 Binding Posts.)

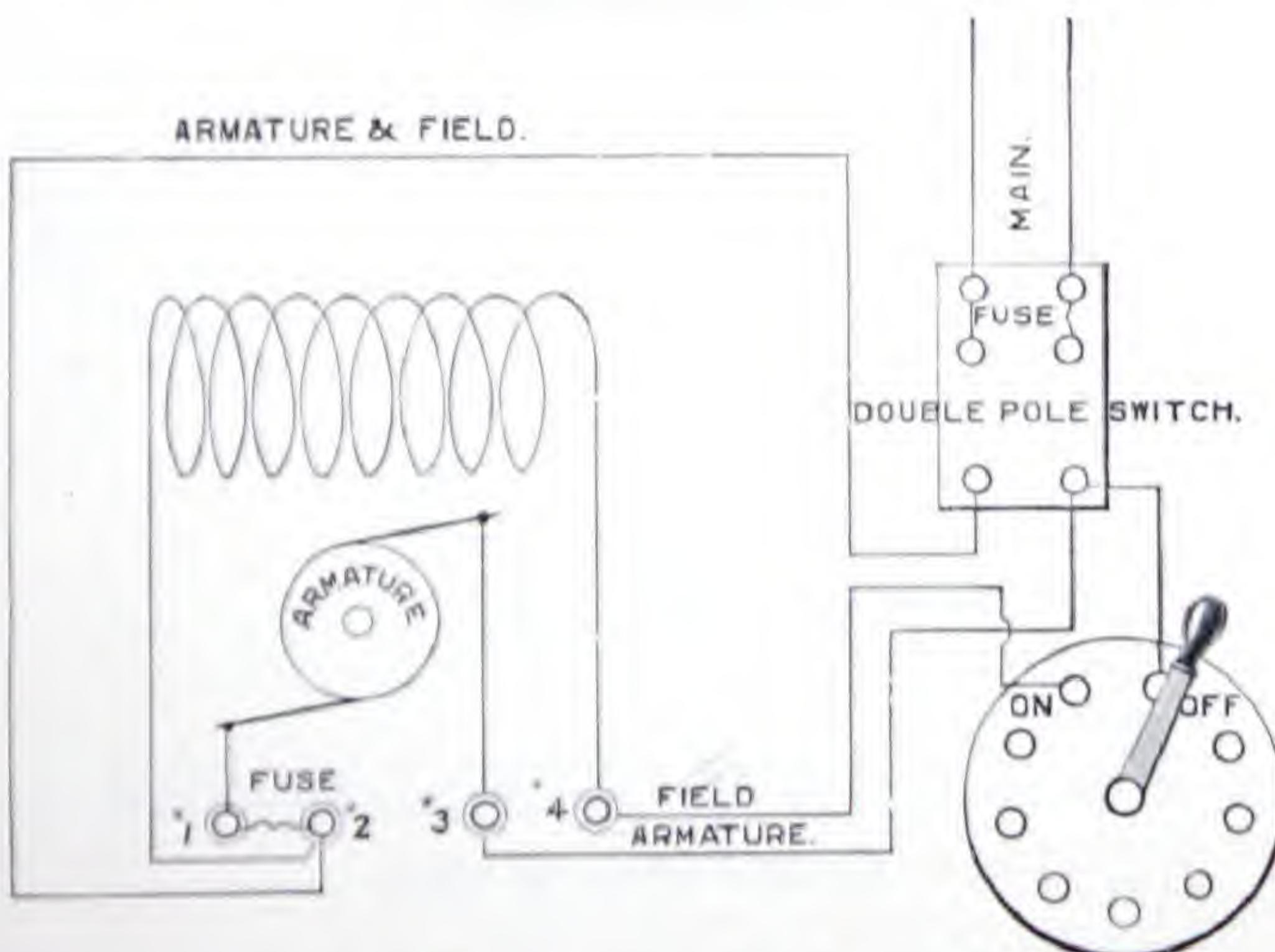


Diagram of Connections for Shunt Dynamo.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Diagrams of Dynamo and Motor Wiring.

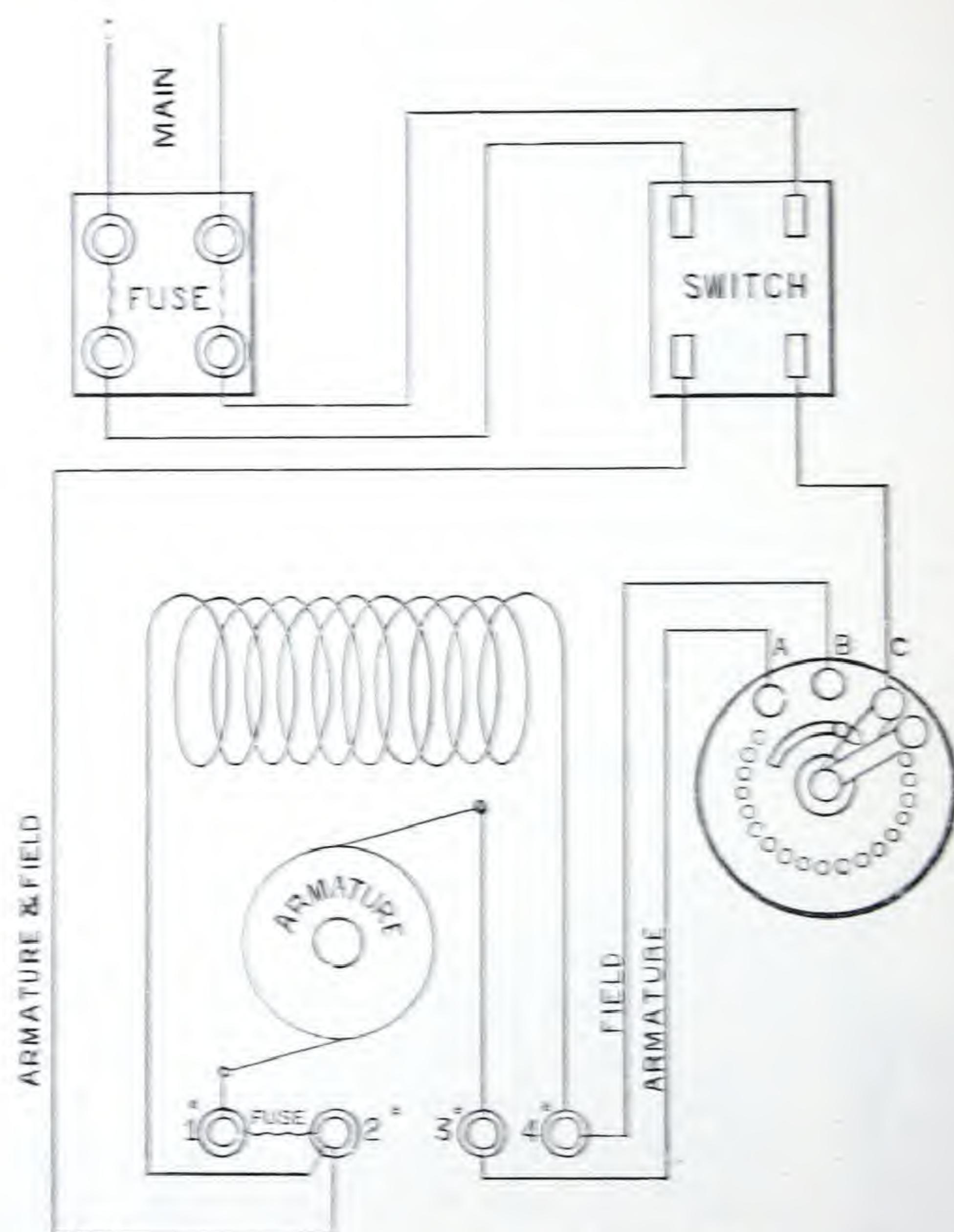


Diagram of Connections for Constant-Speed Motor with Automatic Cut-off Starting Box.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Diagram of Motor and Dynamo Wiring.

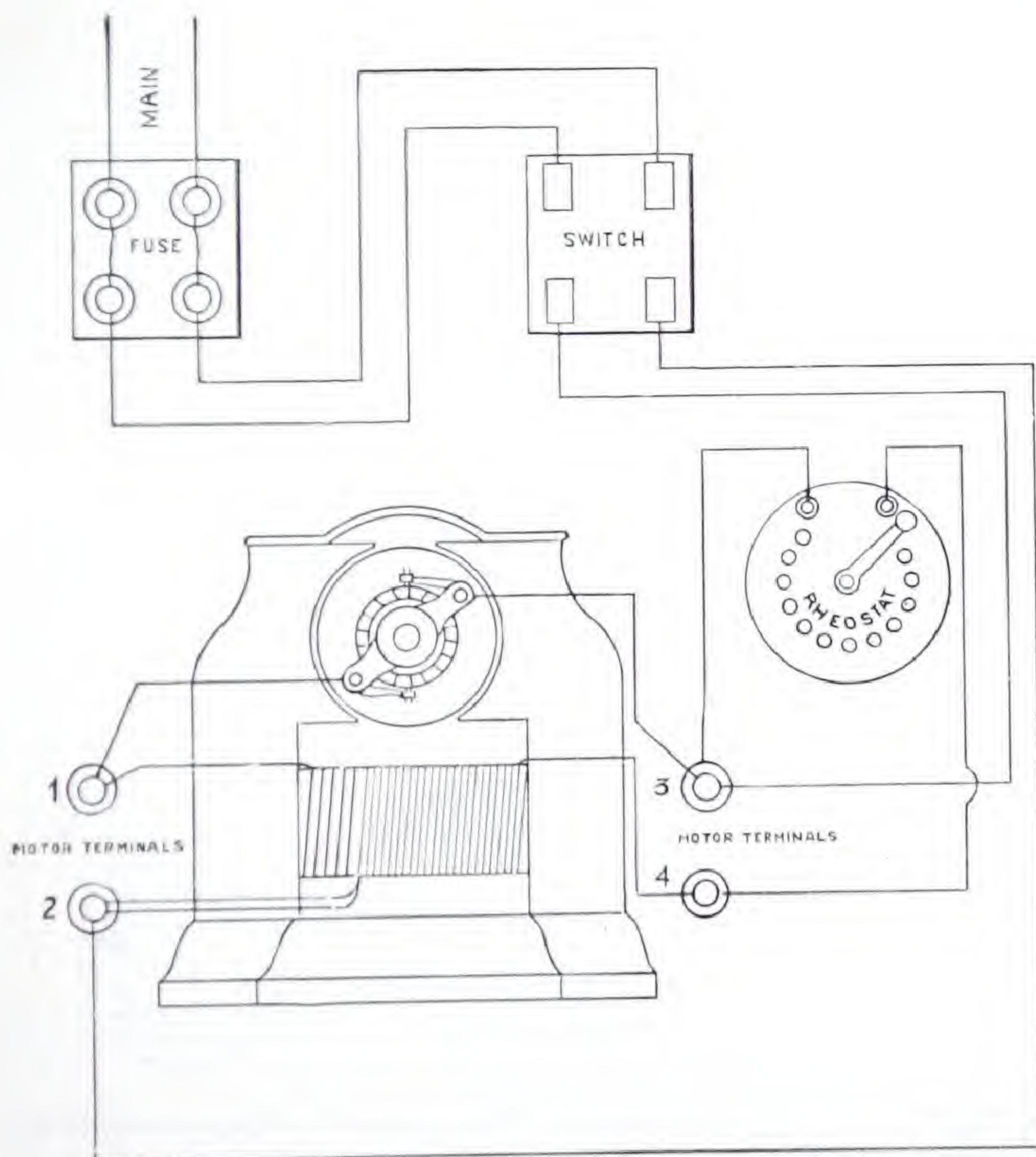


Diagram of Connections for Compound Dynamo.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Diagrams of Dynamo and Motor Connections.

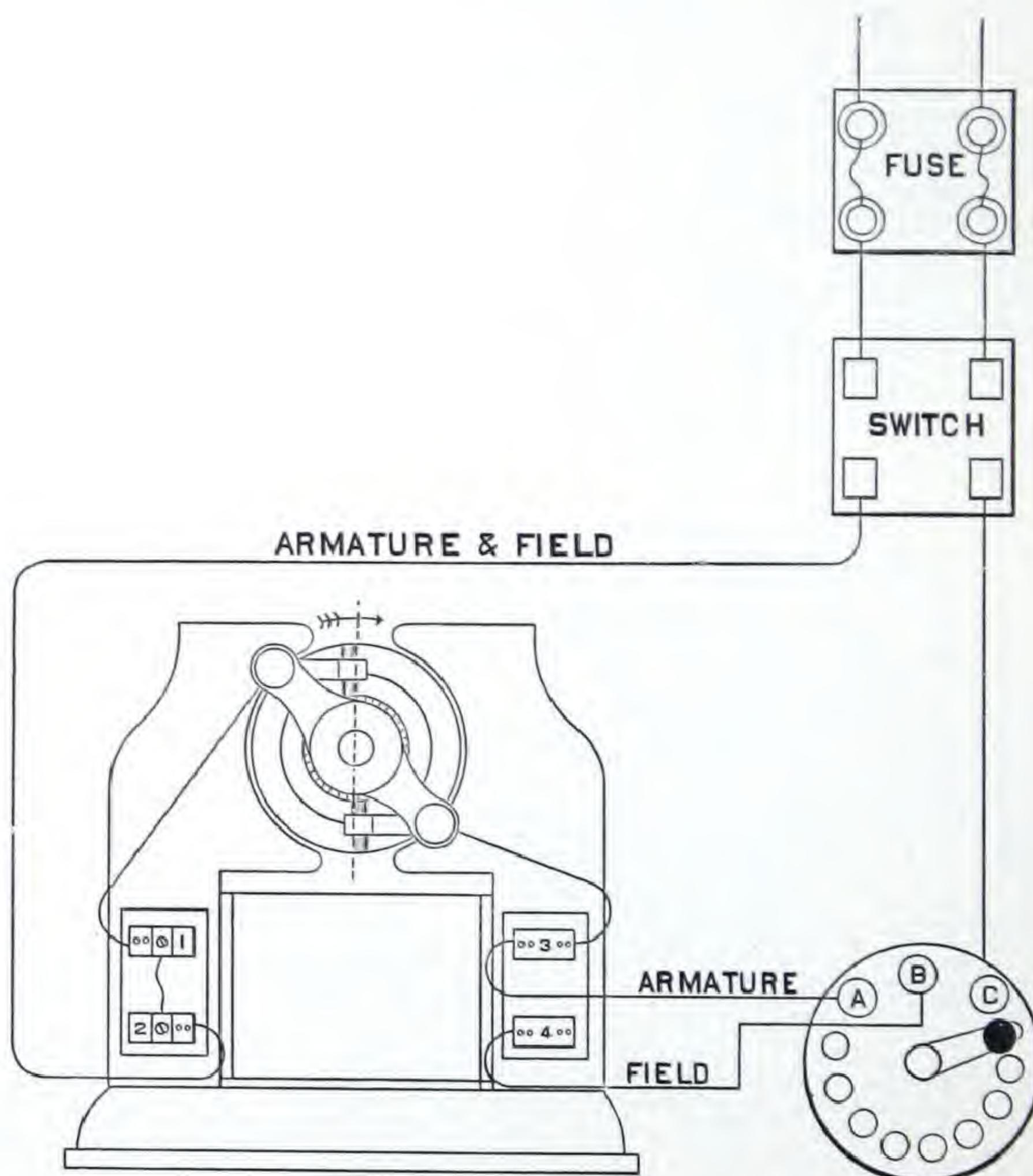


Diagram of Connections of Motor with Open Circuiting
Starting Box. (3 Binding Posts.)

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

Motor Diagrams.

(CONTINUED.)

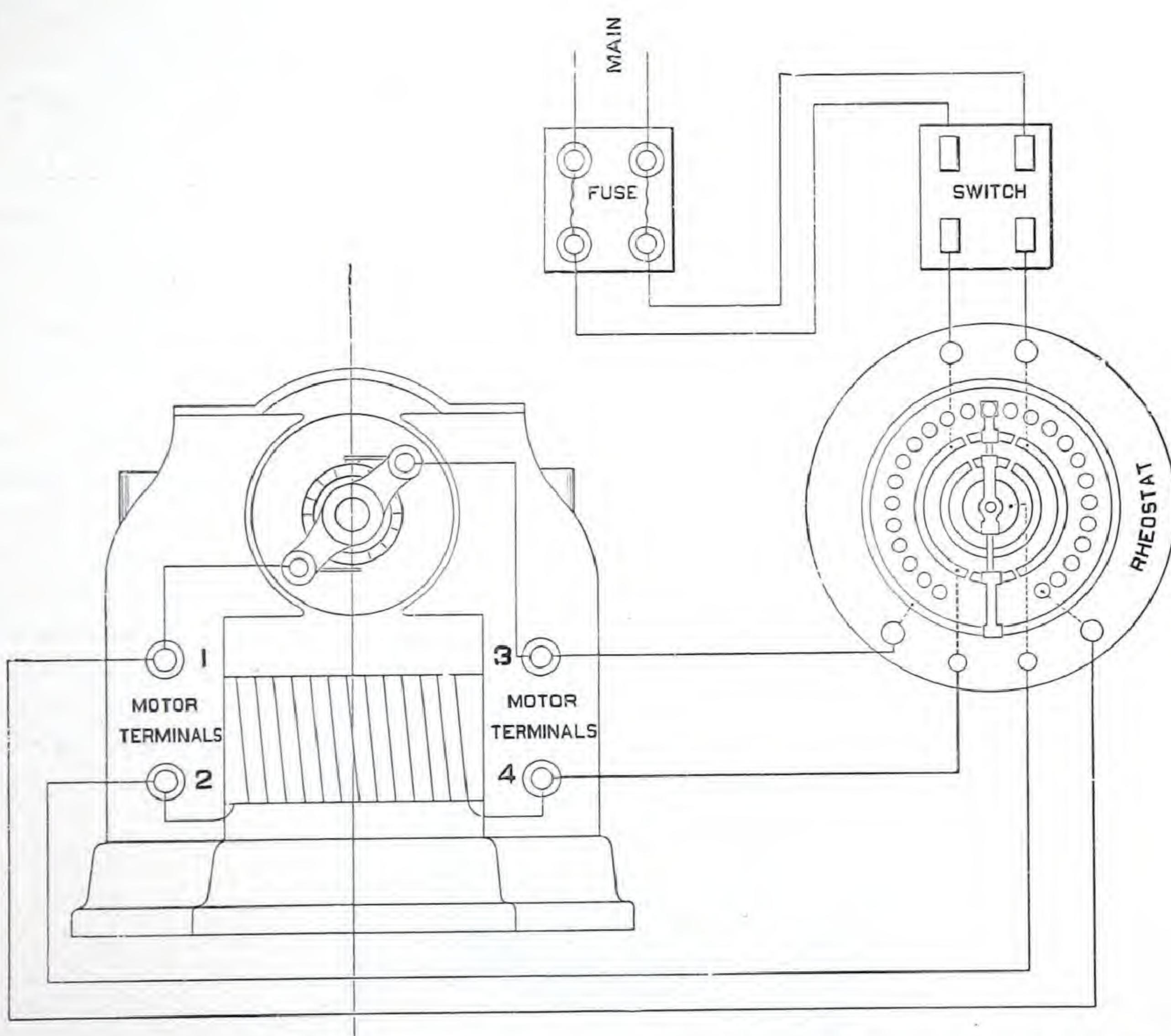


Diagram of H.-C. Motor with Combined Reversing Switch and Rheostat.

Boston, Mass.

General Care of Motors.

SO LITTLE attention is required by the H.-C. Motor that it is in danger of receiving none. However, like any other machine, it must have intelligent care to obtain the best results. One man should be appointed to have charge of the motor, and held responsible. The following hints from an experienced dynamo tender will help him to fulfil the duty with credit: First, let the person who expects to care for a machine make its acquaintance. Find out what you can do to it with safety, and then do not be afraid of it. With a dynamo electrical machine it is impossible to experience the effects of the current providing you do not touch more than one part of the machine at once, and providing you are standing on dry wood or other insulating material. Now, remembering these two facts, you can do any of the operations of oiling the bearings, of cleaning or lubricating the commutator, of adjusting the brushes (being careful not to lift all of them on one side of the machine at once), with perfect safety while the machine is running. Any serious fault in a motor will usually result in blowing out the fuses. As long as fuses of the right capacity do not blow, and no smoke issues from any part of a motor, you may be pretty sure that the machine has developed no serious fault. Sparking at the brushes or a hot commutator do not necessarily indicate a fault in the armature or elsewhere, but can usually be set right by a minute's proper attention. What that is experience will have to be your chief instructor, but try the following:—

Adjust sparking brush forward and backward; move rocker arm through small angle each way; alter tension on brushes. Lubricate the commutator with vaseline, or vaseline and plumbago mixed, applying in very small quantities. If commutator feels rough, smooth it with fine sandpaper and then lubricate. Sometimes it is well to soak a carbon brush in mineral oil over night, in order that it may run with less noise. Persevere in your efforts to get your commutator running in good shape; it is well worth while. When you have once learned to run the machine so that there is no perceptible spark, and the commutator has a nice polished surface of a dark reddish brown color, you have succeeded, and five minutes a day will keep it so. Wipe your machine clean all over every day before starting. Attend carefully to the commutator and bearings, and your employer will not be called upon to pay a repair bill for years.

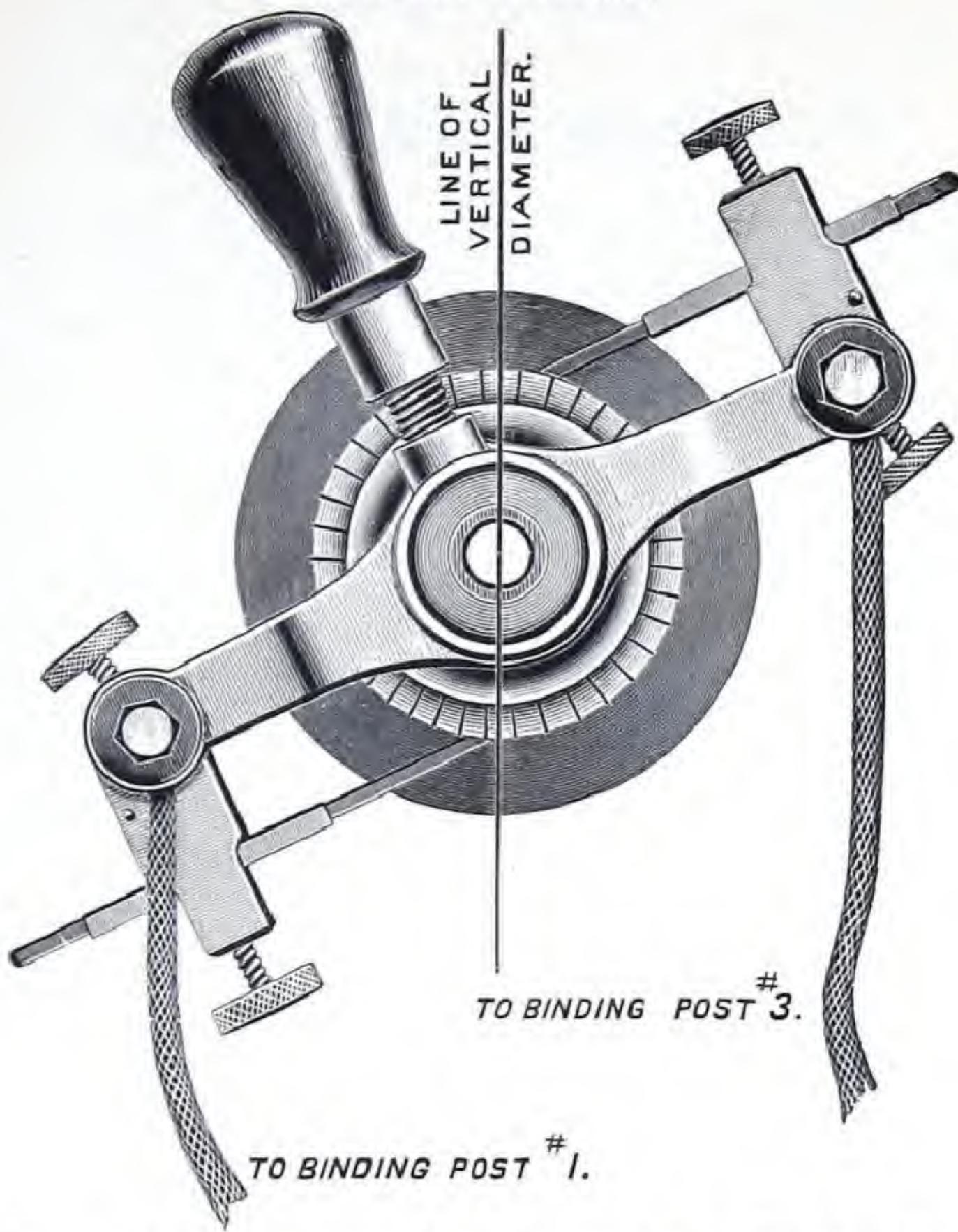
Position of Brushes.

THE brushes should touch the commutator about one segment back of the vertical diameter on a motor, as shown on the following diagram. On a generator, they should touch the commutator about one segment in front of the vertical diameter. The springs on the brush holder should wind up when the brush is lifted from the commutator. Motors having four brushes usually have two right-hand and two left-hand brush holders. These should be turned around when reversing the motor, and should change places with each other. A left-hand holder can be changed to a right, or *vice versa*, by removing the screw fastening the end of the spring, and turning around the hub.

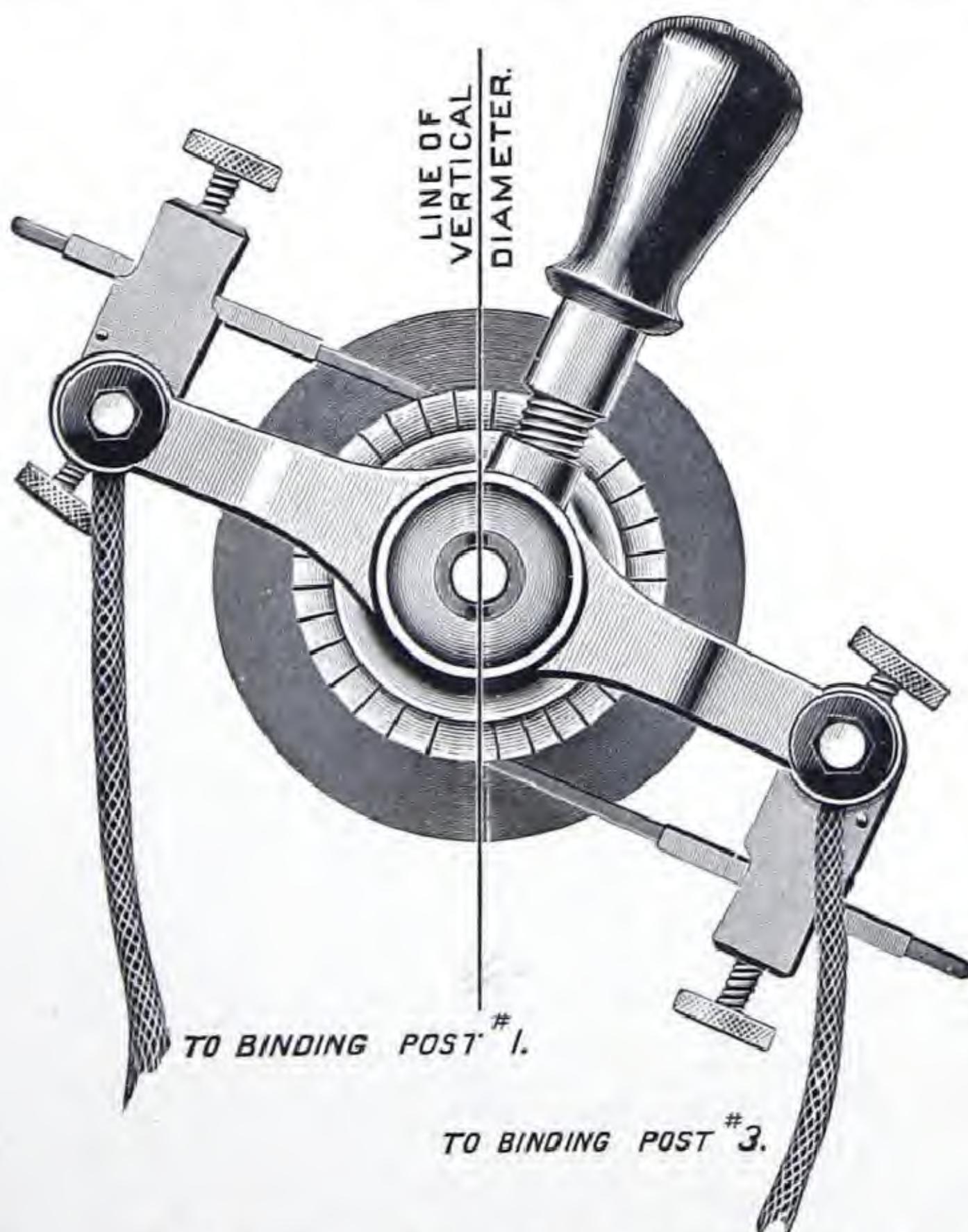
Diagram of Correct Position of Brushes.

RUNNING RIGHT AND LEFT HANDED.

(TANGENT PATTERN.)



Position of Brushes for Running Right-Handed.



Position of Brushes for Running Left-Handed.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

To Remove Armature.

SHOULD it be necessary to remove the armature, proceed as follows: Take off pulley. Draw off oil, if the machine has self-oiling bearings. Take out bolts holding in place back pillow block, and loosen those holding front one. Revolve back pillow block on shaft until it is free to slide on shaft, then slip it off. Slip out the armature, being careful not to loosen bands by allowing them to catch on frame of machine. In replacing, the following precautions are necessary: If bearings are self-oiling, raise the lubricating rings in journals before entering shaft. After putting all parts in place make sure that the pillow blocks fit in their sockets before screwing home the bolts holding them down. By moving them a little each way until they fall solidly into their sockets, the right place will be readily found. When this is done, screw up the bolt from beneath first, and if you have succeeded in rightly placing the pillow block the armature will then turn as easily as when the pillow block bolts were loose. Now screw up the remaining bolts, if any, being careful to work both up together, and make sure that the armature turns freely before starting the Motor. The bearings are self-aligning, but in putting machine together the above precautions are necessary that they may make their own alignment.

Wiring for Motors.

To know the proper size of wire to use with any Motor, measure the distance (one way) as the wire is to be run from the place where the Electric Light Company puts its cutout, to the Motor itself. The H.-P. of Motor, voltage, and allowed percentage of loss being known, the constant for these factors can be found in the following table.

Multiply the constant by the distance in feet, and the product is the number of circular mils required in a wire large enough for the work. From a table of wire gauges the size can be determined.

It must be remembered that the wire must be large enough (irrespective of the amount of drop) to safely carry the current. Fire-insurance rules generally determine this.

TABLE OF CONSTANTS, FOR ELECTRIC MOTOR WIRING.

EFFICIENCY OF MOTOR TAKEN AT 90%

HORSE POWER.		$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	5	$7\frac{1}{2}$	10	15	20
$\frac{1}{2}$	110 VOLTS	38.	75.	150.	300.	600.	900.	1500.	2250.	3000.	4500.	6000.
	220 VOLTS	9.5	19.	38.	75.	150.	225.	375.	562.	750.	1125.	1500.
	500 VOLTS	1.8	3.6	7.3	14.6	29.	44.	73.	110.	146.	220.	290.
$\frac{1}{4}$	110 VOLTS	19.	38.	75.	150.	300.	450.	750.	1125.	1500.	2250.	3000.
	220 VOLTS	4.7	9.5	19.	38.	75.	112.	187.	281.	375.	562.	750.
	500 VOLTS	.9	1.8	3.6	7.3	14.6	22.	36.5	55.	73.	110.	146.
$\frac{1}{2}$	110 VOLTS	9.5	19.	38.	75.	150.	225.	380.	562.	750.	1125.	1500.
	220 VOLTS	2.4	4.7	9.5	19.	38.	56.	94.	140.	187.	262.	375.
	500 VOLTS	.45	.9	1.8	3.6	7.3	11.	18.	27.5	36.5	55.	73.
$\frac{5}{8}$	110 VOLTS	4.	7.5	15.	30.	60.	90.	150.	225.	300.	450.	600.
	220 VOLTS	1.	2.	4.	7.5	15.	23.	37.	56.	75.	112.	150.
	500 VOLTS	.2	.4	.7	1.5	2.9	4.4	7.3	11.	14.6	22.	29.

....THE HOLTZER-CABOT ELECTRIC COMPANY....

Boston, Mass.

DIRECTIONS FOR INSTALLING

Holtzer-Cabot Motors and Dynamos.

SELECTING A MOTOR OR DYNAMO.

Electrical machinery generally runs with least attention and a maximum efficiency at about two-thirds to three-quarters its full-rated load, and in selecting a motor or dynamo it is well to take this fact into consideration. While in general an H.-C. Motor can be loaded considerably beyond its rated capacity without injury, if under skilled attendance, it is advisable to keep the load below the rated capacity, as the attention required is always less under those circumstances.

LOCATING.

Place the dynamo or motor in as cool, dry and well-ventilated a place as possible. Place it high enough from the floor and far enough from the walls to be readily accessible from all sides for oiling, cleaning, and adjusting the brushes; and on supports substantial enough to prevent vibration. Place it, if possible, in a conspicuous place. Out of sight, out of mind, runs the adage. Cleanliness is essential for obtaining long life and satisfactory service from an electric motor.

WIRING.

All H.-C. starting boxes are designed to be fastened to the wall, not placed on the floor. A substantial double-pole switch and fusible cut-out should be provided with each motor, and should be placed, preferably, near the motor. The wire should be of sufficient cross section to carry the current marked on the name plate without heating, except the field wire, which may be in all cases No. 14 B. & S. Gauge. Use fuses of the capacity marked on motor name plate, and keep several on hand so that in case of an accident you can readily replace them.

SELECTION AND CARE OF BRUSHES.

Copper brushes run with less noise than carbon, and are to be preferred when the attendant is willing to exercise a little patience in learning to adjust and care for them; but unless they are adjusted and lubricated once in a while, they are likely to cut the commutator and spark. It is therefore best to use carbon in all cases where the machine is likely to have no regular attendant.

TURNING OFF THE COMMUTATOR.

When the commutator needs turning off, take out the armature and put into a lathe. Use a tool with a clean, sharp edge, with good clearance.

Run it at a lively speed, as a low speed such as is used for steel will not work so well. After turning off enough to make it true, file it with a good sharp file (about No. 4 hand). Then look over the divisions carefully, and see if there are any chips which bridge over the mica. If there are, remove them with the point of a knife, not cutting into the mica any more than necessary.

Never use emery cloth to smooth the commutator, as it will charge into the copper and stay there, cutting away the brushes and causing much trouble. If anything of the kind is to be used, take fine sandpaper.

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